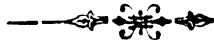


The Vedic Calendar.

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THE VEDIC CALENDAR.

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The Intercalary Month.

THE term "Vedic Calendar" may appear at the outset to be an anachronism, for the reason that there are no clear references to any kind of calendar in the Vedas proper. Even in the Brāhmaṇas, references to a calendar are so vague that it is hardly possible to form a clear conception of the precise nature of the calendar that was in use. But coming to the Sūtras, especially those of the Sāmaveda, we find precise data to determine the various systems of calendar in observance during the Sūtra period. One might, therefore, be led to think that the term "Sūtraic Calendar" would be preferable to that of "Vedic Calendar." But it should be borne in mind that the various systems of calendar described in the Sūtras are not the result of an observation of the heavens in a day, but are the outcome of the experience gained and adjustments made by many successive calculators of time. Nor are allusions to a calendar altogether wanting even in the Vedas. The description of the New Year's Day as occurring on the Ēkāśhtaka day, i.e., the eighth day of the dark half of the month of Māgha (corresponding to December-January) in the times with which we are dealing, as well as the distinct references to a thirteenth month which must necessarily have been an additional month intercalated for the purpose of keeping the beginning of the year more or less close to its natural time, go a long way to prove that the Vedic poets kept a systematised calendar based upon scientific principles. The beginning of the year on the Ēkāśhtaka day is thus described in the Atharvaveda, III 10—

"(1) She first shone out, she became a milch-cow at Yama's. let her, rich in milk, yield (*duh*) to us each further summer."

"(2) The night which the gods rejoice to meet as a milch cow coming unite them, which is the spouse (*patni*) of the year, let her be very auspicious to us."

"(3) Thou, O night, whom we worship as model (*prati*) of the year, do thou unto our long-lived progeny with abundance of wealth."

"(4) This same is she that first shone out, among these other ones she goes about, having entered, great greatneses are within her; the bride (*patni*), the new generation hath conquered."

"(8) Hither hath come the year, thy spouse, O sole Ashtakā, do thou unite our long-lived progeny with abundance of wealth."

"(13) Thou whose son is Indra, whose son is Sōma, daughter art thou of Prajāpati, fully thou our desires, accept our oblation."

A similar hymn with important variations is also found in the Yajurveda, Taittiriya-Sambhitā, IV. 3.11 :—

इयमेव सा या प्रथमा व्योच्छ्रवतरस्यां चरति प्रविष्टा ।
वधूर्जज्ञान नवगज्जनित्री त्रय एतां महिमानस्तत्त्वे ॥ १ ॥
छंदस्वती उपसा पेषिषानि समान योनिमनु सचरती ।
सूर्यवस्ती विचरत प्रज्ञाननी केतु कृष्णाने अजरे भूरिरेतसा ॥ २ ॥
ऋतस्य पंधामनु तिस्र आगु स्त्रयो धर्मासो भनु ज्योतिषागु ।
प्रजामेका रक्षत्यूर्जमेका व्रतमेका रक्षति देवयुताम् ॥ ३ ॥
चतुष्टयो अभवद्या तृतीया यज्ञस्य पक्षावृषयो भवती ।
गायत्री त्रिष्टुभ जगर्नास्तुष्टुमे बृहर्के युजाताः सुवराभरन्निदम् ॥ ४ ॥
पचभिधाता विधाविद यत्तासां स्वसृजनयत् पंच पंच ।
तासामु यति प्रयवेण पच नानारूपाणि ऋतवो वसता ॥ ५ ॥
त्रिंशस्वसार उपयति निष्कृत समानं कैतुं प्रतिमुंचमानाः ।

ऋतुस्तन्वते कवयः प्रजानतीं मध्ये छंदसः परियन्ति भास्वती ॥ ६ ॥
 ज्योतिष्मती प्रतिमुञ्चते नभो रात्रां देवी सूर्यस्य व्रतानि ।
 वि पश्यन्ति पशवो जायमाना नानारूपा मातुरस्या उपस्थे ॥ ७ ॥
 एकाष्टका तपसा तप्यमाना जजान गर्भे महिमानमिन्द्रम् ।
 तेन दस्युन् व्यसहंत देवा हंतासुराणामभवच्छचीभि ॥ ८ ॥
 अनानुज्ञामनुजां मामकर्त सत्यं वदत्यन्विच्छ एतद्भयासम् ।
 अस्य सुमतौ यथा यूयमन्या वो अन्यामति मा प्रयुक्त ॥ ९ ॥
 अभून्मम सुमतौ विश्वेश आष्ट प्रतिष्ठामविदद्धि गाधम् ।
 भूयासमस्य सुमतौ यथा यूयमन्या वो अन्यामति मा प्रयुक्त ॥ १० ॥
 पंच द्युष्टीरनु पंच सोहा गां पंचनाम्नीयुतवोऽनु पच ।
 पंचदिशः पंचदशेन कृषाः समानमूर्ध्वरिभिलोकमेकम् ॥ ११ ॥
 ऋतस्य गर्भः प्रथमा द्युषुष्यपामेका महिमानं विनर्ति ।
 सूर्यस्यैका चरति निष्कृतेषु धर्मस्यैका सवितैका नियच्छति ॥ १२ ॥
 या प्रथमा व्यौच्छत्सा धेनुर्भवद्यमे ।
 सा न पयस्वती धुक्चोत्तरामुत्तरां समाम् ॥ १३ ॥
 शुक्रर्षभा नभसा ज्योतिषागां विश्वरूपा शबलीरग्निश्रेतुः ।
 समानमर्थं स्वपस्यमाना विश्वती जरामजर उष आगाः ॥ १४ ॥
 ऋतूनां पत्नी प्रथमेयमागारह्णां नेत्री जनित्री प्रजानाम् ।
 एका सती बहुधोषो व्युच्छत्यर्जाणां त्व जरयसि सर्वमन्यत ॥ १५ ॥

“(1) It is she that first shone out ; having entered into this (*earth*), she goes about ; (*like*) a bride, newly married (*to the New Year*), she has become the generatrix (*of the days that follow*), three are the great lights that associate with her

“(2) Extolled in metres, these two shining dawns, coming out of the same womb, and being the wives of the sun, go about all-knowing, making a flag, free from old age, and impregnated with abundant seed.

“(3) Three dawns have reached the path of the sacrifice, three lights [the fire, the sun, and the moon] have also approached it; of them, one protects the offspring, one the vigour, and one the rite of those who like to please the gods.

“(4) She who is the fourth has passed into the four sets of Sâma-chants [nine-versed, fifteen-versed, seventeen-versed, and twenty-one-versed chants], maintaining the two wings [halves] of the sacrifice [*i. e.*, the year] as known to the sages, and giving rise to the Great Litany composed of Gâyatri, Trishtubh, Jagati, and Anushtubh metres ; and she has preserved this heaven [the solstice].

“(5) With five (*days*) the Creator has made this ; he has also created five and five sisters of them ; taking various forms and being clothed in sacrificial splendour, five of them run with great speed.

“(6) Thirty sisters [*days*] partake of the rite, spreading out the same flag ; they make the seasons ; being wise and all-knowing and residing in the metres, they go about with great splendour.

“(7) Clothed in splendour, this shining night takes to herself the rites addressed to the sun above : even the various kinds of beasts, on awakening, see her on the lap of this mother [the earth].

“(8) This eighth day, bearing the troubles of pregnancy, has brought forth this great Indra, with his help the gods repelled the enemies ; in virtue of his own might, he has become the destroyer of the Asuras.

"(9) O sole Ashtakās, ye gave a sister to me hitherto without a sister; ye speak the truth—listen to this prayer: just as ye are pleased with the behaviour of this (*Indra*), so may ye be pleased with mine; do not send me away to any one else!

"(10) This all-knowing dawn stepped into my mind and has taken a firm hold of it; just as ye are pleased with this (*Indra*), so may ye be pleased with me; do not send me away to any one else;

"(11) The five mornings, the five milkings, and the five seasons follow the cow with five names; the five quarters regulated by the fifteen-versed chant and possessed of the same characteristics as the five mornings follow this single light [the dawn].

"(12) (*Of the five mornings*) the first is the womb of the dawn: one bears the magnificence of the waters, one presides at the rites addressed to the sun; one presides over the heat; and one the sun controls.

"(13) She that first shone out has become a cow at Yama's; let her, rich in milk, yield to us each further summer!

"(14) Foremost among the lights, clothed in brilliant splendour, has arrived this illuminating dawn with various colours, like a flag of the sacrificial fire: O ever youthful dawn, conducive to the performance of unchanging rites, and grey with old age, thou hast arrived!

"(15) The wife of the seasons, the first (*dawn*) has arrived, leading the days and being the mother of creatures; though one, thou hast become many; free from old age, thou causest the rest to grow old."

Likewise the Tānīyamahābrāhmaṇa describes the Ekashtaka as the wife of the year:—V. 9 2.

एषा वै सवत्सरस्य पत्नी यदेकाष्टका. एतस्यां वा गतां रात्रिं वसति साक्षादेव तत्संवत्सरमारभ्य दीक्षते.

"What is called the Ekashtakā (*day*) is the wife of the year, when the night of this day arrives, (*prajapati*) lies with her. Hence, commencing with the (*true*) beginning of the year, (*sacrificers*) observe the rite of initiation."

The important points to be particularly noticed in the above passages are: (1) the beginning of the year, probably solar, on the eighth day of the dark half of the month Mīgha, (2) the designation of this day by such names as 'a cow,' 'dawn,' 'Prajapati's daughter,' and 'Suryā'; (3) the association or a kind of secret marriage of the dawn with three lights, the fire, the moon, and the sun, as pointed out by Śāyana in his commentary on verse 1, (4) the birth of the days of the following year or cycle of years, as well as of Indra and Sōma from the marriage of the dawn with the sun; (5) the celebration of the dawn by the four well-known Sīma-chants; namely, the nine-versed chant, the fifteen-versed chant, the seventeen-versed chant, and the twenty-one-versed chant, each of which is, as we shall see, intended to signify as many intercalary days as the number of verses contained in it. (6) the destruction of enemies and Āsuras brought about by Indra, the son of the dawn.

As regards the first point, it is true that we are told nowhere in the Vedas themselves that the word Ekashtakā means the eighth day of the dark half of the month of Mīgha, still, on the authority of Āpastamba and other Sūtra-writers, who have defined it as such, we may take in to mean that particular day. From the next three points we have to understand that, at the commencement of every year or cycle of years, it was the usual custom with the Vedic poets to celebrate symbolical marriage of the New Year's Day with the sun in order to enable the new year to beget its 720 children,¹ i. e., its days and nights, or, in other words, to perpetuate an auspicious flow of time for the selves. This seems to be the sum and substance of the celebrated marriage hymns,² in which the marriage procession of Sūryā or the dawn to be wedded to the sun is

¹ R. V. 1. 134 10, 11.

² R. V. x. 55, and A. V. xiv. 1, 2.

the subject of a long and mystic description, and which are even now recited on the occasions of marriages performed as a rule after the winter solstice and before the summer solstice. The recognition of the dawn first by Sôma, the moon, next by Gandharva,³ one of the 27 *nakshatras*, then by Agni, and lastly by men, seems to signify the association of the dawn first with the synodic lunar year of 354 days, next with the sidereal lunar year of 351 days containing 13 months each of 27 days corresponding to the 27 *nakshatras* or Gandharvas, then with the Sâvana year of 360 days, dedicated to the sacrificial fire-god from whom the dawn or the twenty-first day, based upon the difference between the Sâvana year and the Julian solar year of 365½ days, is believed to have come under the protection or observance of men. The fact of making the dawn the object of praise in the Chatushtômas or four sets of Sâma-chants seems to render probable the above explanation of the two obscure verses of the marriage-hymn.⁴ The five mornings which are said to precede the brilliant dawn in verse 11 seem to be five days added after the end of the Sâvana year. As regards the destruction of enemies and Asuras by Indra, we shall presently see that they are not real enemies or Asuras, but intercalary days regarded as such.

Thus, while the Yajurveda connects the mornings and the mystic cows with the Chatushtômas, thereby implying the final number of intercalary days to be twenty-one, their number is distinctly stated as three times seven in the Sâma-vêda.

तेऽमन्वत प्रथमं नाम गोनाम्
त्रिस्सप्त परमं नाम जानन ।
ता जानतीरभ्यनृषत क्षाः
आविर्भुवन्नरुणीर्यक्षसा गावः ॥

“ First they (*the sages*) came to know the sacred name of the cows ; they came to know the sacred names to be three times seven ; knowing them, they extolled the morning (*kshâh*) : then the red cows became famous. ”

There are two more verses which express the same idea :—

अयं पुनान उपसो अरोचयत्
अयं सिधुभ्यो अभवदु लोककृत् ।
अयं त्रिस्सप्त दुनुहान आशिरम्
सोमो द्वे पवते चारुमत्सरः ॥ Sâma, ii, 1, 17, 3.

त्रिरस्मै सप्त धेनवो दुनुहिरे
सत्यामाशिरं परं व्योमन् ।
चत्वार्यन्या भुवनानि निर्णिजे
चारुणि चक्रे यदुनेरवर्धत ॥ Sâma, vi, 2, 2, 7.

“ He, being purified, hath made the mornings shine ; and it is he who gave the rivers room to flow ; making the three times seven pour out the milky stream, Sôma, the cheerer, yields whatever the heart finds sweet. ”

“ The three times seven milch-kine in the loftiest heaven have for this Sôma poured the genuine milky draught ; four other beauteous worlds hath he made for his adornment when he waxed in strength through holy rites. ”

³ *Vâsaneyasamhitâ* 18, 40 ; and also *Taittiriya* I, 7, 7.

⁴ *R. V.* x, 85, 40-41 ; *A. V.* xiv, 2, 3, 4.

For reasons to be pointed out further on, I presume that the four worlds referred to in the above verse are four solar years, and that the twenty-one cows or mornings are the intercalary days made up of the four times five days and a quarter which is the difference between a Sāvāna and a solar year. I do not, however, contend that it is clear from the above passages themselves that the twenty-one cows or mornings are intended to signify so many intercalary days and intercalary days alone. Still, I believe that scholars will agree with me in holding that, so far as the beginning of the year on the Ekāṣṭaka day is concerned, these passages leave no doubt whatever. The Ekāṣṭaka day is clearly a lunar day; and the year that was practically observed by the Vedic poets was the Sāvāna year of 360 days. The number of days from one Ekāṣṭaka or the eighth day of the dark half of the month of Māgha to the next Ekāṣṭaka is 354. Accordingly, if the Sāvāna year of 360 days, having once begun (on the Ekāṣṭaka day, is to begin again, on that same day, there must necessarily be an adjustment of the difference of six days between the lunar and the Sāvāna years by the addition of one month to the lunar year in every five years. If instead of the Sāvāna year, they adopted a solar or a sidereal year, even then they must necessarily have adjusted the respective differences between the lunar and the solar or between the lunar and the sidereal years by intercalation in the form of days or months. Accordingly, we find clear references to a thirteenth intercalary month not only in the Yajurveda and the Atharvaveda, but also in the Rīgvēda. The Rīgvēda 1, 25, 8, thus alludes to the intercalary month :—

वेद मासो भूतव्रतो द्वादश प्रजावत् । वेदा य उपजायते ॥

“He, who, accepting the rites (*dedicated to him*), knows the twelve months and their reductions, and that which is supplementarily engendered.”

In his translation of the Rīgvēda, Professor H. H. Wilson remarked as follows :—

“वेद य उपजायते, who knows what is *upajate*, additionally or subordinately produced. The expression is obscure, but in connection with the preceding, वेद मासो द्वादश, who knows the twelve months, we cannot doubt the correctness of the scholiast's conclusion, that the thirteenth, the supplementary or intercalary month of the Hindu luni-solar year, is alluded to; that ‘the thirteenth or additional month which is produced of itself, in connection with the year,’ ‘यत्त्रयोदशोऽधिमास उपजायते सवत्सरसमीपे स्वयमेवोत्पद्यते.’” The passage is important, as indicating the concurrent use of lunar and solar years at this period and the method of adjusting the one to the other.”

Notwithstanding Sāvāna's interpretation of the word *upajate* in the sense of ‘a supplementary month,’ it is doubtful whether the word indicates a complete intercalary month or an intercalated period less than a month; for we shall presently see that before the custom of adjusting the lunar and the solar reckoning by the addition of a complete month came into vogue, the usual practice was to adjust them by adding as many days as formed the difference between any two kinds of years or sets of years. Still, it is certain that some sort of intercalation, either in the form of a month or in the form of a period less than a month, is what is implied in the above verse of the Rīgvēda. But coming to the Atharvaveda, we see therein a clear description of a thirteenth intercalary month :—

अहोरात्रैर्विमितं त्रिंशदंगं त्रयोदशं मासं यो निर्मिमीते ।

तस्य देवस्य क्रुद्धस्तदागो य एवं विद्वांसं ब्राह्मणं जिनाति. ॥

“He who measures the thirteenth month, fabricated of days and nights, having thirty members—against that god, angered, is this offence.” A. V., XII, 3, 8.

सनिवसो नामासि

त्रयोदशो मास इन्द्रस्य गृहः ।

“Weakling by name art thou, the thirteenth month, Indra’s house.” A. V., v. 6. 4.

In the *Kṛishṇa-Yajurveda*, i. 4. 14, the twelve months together with a thirteenth intercalated month are thus enumerated :—

मधुश्च माधवश्च शुक्रश्च शुक्लिश्च नभश्च नभस्यश्च इषश्चोर्जश्च सहश्च सहस्यश्च तपश्च तपस्यश्चोपयामगृहीतोऽसि संसर्पोऽसि अंहस्पत्याय स्वा.

“Thou art the month of Madhu,⁵ the month of Mādhava, the month of Sukra, the month of Suchi, the month of Nabhas, the month of Nabhasya, the month of Isha, the month of Ūrja, the month of Sahas, the month of Sahasya, the month of Tapas, and the month of Tapasya; and thou art caught hold of in a wooden vessel; thou art the month Samsarpa [a creeping month], and thou art the receptacle of sins.”

The *Brāhmaṇa* portion contained in the *Kṛishṇa-Yajurveda*, vi. 5, 3, 12, comments on this passage as follows :—

प्रसिद्धमेवाध्वर्युर्दक्षिणेन प्रपद्यते प्रसिद्धं प्रतिप्रस्थातोत्तरेण. तस्मादादित्येष्वण्मासो दक्षिणेनैति षडुत्तरेण उपयामगृहीतोऽसि संसर्पोऽस्यंहस्पत्याय त्वेत्याहास्ति त्रयोदशो मास इत्याहुस्तमेव तस्मीनाति.

“Clearly does the Adhvaryu first go to the south; clearly the Pratiprasthâtri priest to the north. Hence does the sun go to the south for six months, and to the north for six months. He says. ‘Thou art caught in a wooden vessel’, thou art Samsarpa [a creeping month] and a receptacle for sins.’ They say that there is also a thirteenth month. it is that thirteenth month which he pleases thereby.”

The symbolical practice connected with this passage is this.—The Adhvaryu priest fills thirteen wooden vessels with Sôma-juice, and with the help of another priest, called Pratiprasthâtri, he makes offerings therefrom to the seasons. While performing the rite, the Adhvaryu goes to the south and the Pratiprasthâtri to the north, imitating the southern and northern movements of the sun respectively. As will be seen, it was in the middle of the year, during the summer or the winter solstice, according as the year began with the winter or the summer solstice, that the intercalary period was inserted, delaying the sun’s turning movement so long and occupying that period in performing the initiatory rites. Hence the reference in this passage to the sun’s northern and southern movements, and to the thirteenth month during which the commencement of those turning movements is delayed. The fact of representing the months by Sôma-vessels is clearly stated in the *Maitrâyaṇiya-Samhitâ*, iii, 10. 4. 5.

द्वादश पात्राण्युपांशुसवनस्त्रयोदश यत्त-

न्मीमांसते पात्राश्चपात्राश्मिति मीमांसं

हि त्रयोदशं मासं मासाश्चमासा इति.

“Twelve are the vessels, the pressing stone, called *Upâṇśusavana* is the thirteenth; the discussion they hold, by asking whether there ought to be a vessel or no vessel (*to represent a thirteenth month*), is a discussion as to whether there is a thirteenth month or no thirteenth month.”

Regarding the sacrificial function observed during a thirteenth month, the *Tândyamahâ Brāhmaṇa*, x, 3. 2, says —

विना नोऽरात्सीदिति मासा उपानीदन् । ते दीक्षयैवाराध्नुवन् । उपसत्सु त्रयोदशमदीक्षयन् । सोऽनुव्यमभवत्. तस्मादुपसत्सु दिशक्षाणांऽनुव्यं भवत्येव च हि त्रयोदशं मासं चक्षते नैव च.

“The months observed the vow of *Upasads* [sessions] with the intention that their father [the year] might prosper. They, however, prospered merely by observing the initiatory rites, and initiated the thirteenth month during the period of the vow of *Upasads* [sessions]. Therefore the thirteenth month became their follower. Hence whoever undergoes the rite of initiation during the period of the vow of *Upasads* [sessions] becomes the follower (*of the rest of the priests*). Accordingly they declare a thirteenth month as existent and also as non-existent.”

⁵ Madhu corresponds to Chaitra; Mādhava to Vaiśākha, and so on.

Again, the *Maitrâyaṇīya-Saṃhitā* i. 5. 5. 6, says:—

अग्नीषोमीयया त्रयोदशी उपस्येयोऽस्ति.

मासस्त्रयोदशः समेवैतयाप्स्वावरुधे.

“The thirteenth lunar day is to be propitiated by the immolation of a beast sacred to Agni and Sôma. There is the thirteenth month; it is that thirteenth month which he catches hold of by this offering.”

These and other references to the New Year's Day and the thirteenth month intercalated solely for the purpose of keeping the seasons or the months in their proper places in the year, are enough to show that the Vedic poets kept a calendar with far more scientific precision than we are pleased to credit them with. Whether we will or no, the fact cannot be denied that the idea of a thirteenth month, *i.e.*, an intercalated month, could not have dawned upon the mind of the Vedic poets unless they had been quite familiar with the true lengths of several kinds of years. There is also reason to believe that, before the system of adjusting the difference between any two kinds of years by the insertion of an intercalary month was begun, the practice was to adjust them by adding sets of intercalary days, such as 9, 11, 12, 21, and so on. That such was the custom, is clear from the following passage of the *Kaṭhasâkhâ-Brahmana*, quoted in the *Smitatattva*.⁶

अर्धमासा वै अधस्तात्संत अक्रामयत मासास्त्यामिति. ते द्वादशाह क्रतुमुपायन् त्रयोदश ब्राह्मणं कृत्वा तस्मिन् मृष्ट्वा उ तिष्ठन् तस्मात्सोऽनायतनः इतरानुपजीवतीति, तस्माद्द्वादशाहस्य त्रयोदशेन ब्राह्मणेन भवितव्यमिति कठशा. खान्नाह्ननम्.

अस्यार्थो जयस्वामिना व्याख्यातः:—

ते चार्धमासा स्त्रयोदश मलमास ब्राह्मणं कृत्वा द्वादशाह क्रतुमुपायन् उपाहृतवन्तः. तस्मिन्मलमासे मृष्ट्वा समाज्यं किमिव्याकांक्षायां अरातीरित्यध्याह्नियते अराती पापानि समाज्यं उदातिष्ठन् पापभारशून्या उत्थिता अभवन्तित्यर्थः तत्र पापनिर्माजनार्थं वादात् संभवत्कालानंतरं कर्म तत्र न कर्तव्यम् न तु निरवकाशमिति अर्ध-वादात् विधिकल्पनायाः प्रतीतिबाधेनैवोचित्यात् अतो नित्यनैमित्तिकशांतिं कांश्च मलमासेन पशुदासः सोऽनायतन इति नाप्यस्य चैत्रादिवत् प्रतिनियतस्थानमित्यर्थः इतरानुपजीवतीति मासांतरेषु चंद्रक्षयवृद्धिभ्यः तस्यापज्जननात्.

“Being at a lower level [*i.e.*, being less than a month], the half-months desired that they might grow into months. They approached the twelve days' sacrifice. Having appointed a Brâhmana as a thirteenth priest [in addition to the twelve priests] and having washed off (*the sins*) on him, they got up. Hence it is that he [the thirteenth month or the priest who represents it] is homeless and dependent for his existence upon others. Hence there ought to be a thirteenth Brâhmana priest in every twelve days' sacrifice. This is a passage from the *B. dhmana* of the *Kaṭha* School.

“This passage is thus commented upon by Jayasvâmin —Having represented the thirteenth, ‘dirty,’ month by a Brâhmana priest, those half-months collected the twelve-days' sacrifice, [*i.e.*, converted it into a month's sacrifice]. Having washed off in that ‘dirty’ month,—if it is asked what was that which they washed off on the ‘dirty’ month, we have to understand the word *arâtu*, ‘enemies’,—having washed off the enemies, *i.e.*, the sins, they got up, *i.e.*, they rose up free from the burden of sin. From the descriptive statement of washing off the sins, it follows that the sacrificial performance which can possibly be observed in the subsequent month should neither be undertaken during the ‘dirty’ month nor be given up. The inference of a rule from a descriptive statement is reasonable inasmuch as the sense of the descriptive statement can otherwise have no application whatever.⁷ Hence the performance of obligatory, casual, expiatory, and other

⁶ *Smitatattva*, Calcutta ed., 1895, p. 782.

⁷ Here the rule is that the sacrifice should neither be performed in the ‘dirty’ month nor be given up but should be performed in the subsequent month. The statement is that of washing off the sins in the dirty month

religious rites is prohibited in a 'dirty' month. 'It is homeless': i.e., like Chaitra and other months, it has not a fixed place of its own in the year. 'Dependent for its existence upon others, i.e., the thirteenth month comes into existence owing to the waxing and waning of the moon in the intervals of months.'

The meaning of the above passage is this :—Giving up a practice of adding twelve days to the synodic lunar year of 354 days in order to adjust it to the sidereal solar year of 366 days, the Vedic poets allowed the twelve days to accumulate to the extent of a month in the course of two and a half years, and then performed their sacrifice at the close of the thirteenth month with thirteen priests, of whom the thirteenth priest represented the thirteenth month, the 'dirty' month, and took up the sins of the sacrificer for the gold that was presented to him.

In the *Ātārêya-Brâhmana*, i, 12, the thirteenth priest is called Sôma-vikrayin, 'seller of Sôma.' This passage, with a brief commentary upon it by Raghunandana Bhaṭṭâchârya, the author of the *Smṛititattva*, runs as follows⁸ :—

प्राच्यां दिशि वै देवाः सोमं राजानमक्रीणंस्तस्मात्प्राच्यां दिशि क्रीणते त्रयोदशान्मासादक्रीणंस्तस्मा-
त्रयोदशो मासो नानुविद्यते पापो हि सोमविक्रीयीति. अस्यायमर्थः
यतोऽधिमासस्सोमविक्रीयी अतोऽसावितरमासवन्नानुविद्यते. विद्यमानोऽपि कर्मानर्हत्वादसन्निवेत्यर्थः
सोमविक्रय्यपि कस्विगतरवत्.

"The gods bought the king Sôma in the eastern direction. Thence he is (*generally*) bought in the eastern direction. They bought him from the thirteenth month. Thence the thirteenth month is found unfit (*for any religious work to be done in it*); a seller of Sôma is (*likewise*) found unfit (*for intercourse*), for such a man is a defaulter." The meaning of the passage is this :—"Because the intercalated month is the seller of Sôma, therefore it has no proper existence like other months. Although it has its own existence, it is yet regarded as having no proper existence inasmuch as no rites are performed in it. The seller of Sôma is like other priests employed for the performance of sacrifice."

As regards the sinful nature of intercalated months, the author of the *Smṛititattva*, quotes the following passage⁹ :—

वस्सरांतरगतं पापं यज्ञानां फलनाशकृत् ।
नैर्ऋतेर्यालुधानाद्यैस्समाक्रांतो विनामकः ॥
इत्यादि ज्योतिषशास्त्रे.

विदुःश्रुतामक्रो विनामकः कुतः मलिम्लुच्चादिनामकत्वात्.

"(*The intercalated month*) contained in the body of the year, is sinful, is destructive of the good results of sacrifices, is infested by Nairṛita, Yātudhâna, and other evil spirits, and is of a disagreeable name. This and other passages are found in astrological works. The word *vinâmaka* means 'that which has a disagreeable name'; for it has Malimlucha and other (*disgusting*) names."

The three passages quoted above throw a flood of light on the nature of the conception which the Vedic poets entertained regarding the intercalary days and months. We have to understand the three important points specified in these passages :—

(1) At first the Vedic poets used to adjust their lunar year with the sidereal solar year by adding twelve days to the former, but in the course of time they gave up that custom and began to intercalate one month to every third lunar year.

⁸ *Smṛititattva*, p. 782.

⁹ *Ibid*, p. 778.

(2) Instead of performing any sacrifice during the intercalated period, they spent that period in performing such accessory rites as are called *Upasad* or sessions and *Dikṣhā* or rites of initiation.

(3) They regarded the intercalated days as being infested by evil spirits and enemies. It is therefore probable that the apparent acts of sorcery undertaken in connection with every kind of sacrifice in order to drive out or to destroy 'those who hated the poets and whom the poets hated', are acts intended to symbolise the fact of getting rid of an intercalated period. Since an intercalated period is regarded, not only as being burdened with dirt or sin, but also as being infested by Varuṇa, Nirṛiti, and other good or evil spirits with nooses in their hands to bind their victims, it is probable that, during an intercalated period, the Vedic poets regarded themselves, not only as being burdened with sin, but also as being bound with the noose (*pāśa*) of Varuṇa or Nirṛiti. It also follows that the removal of sin or of Varuṇa's fetters at the close of a period of twelve or twenty-one days, is a technical expression of the Vedic poets implying the intercalary nature of those days. The removal of guilt at the close of the twelve intercalated days is thus referred to in the *Aitārēya-Brāhmaṇa*, IV. 4, 24 —

त्रयश्च वा एते त्र्यहा आदशमहारात्रावतिरात्रौ यद्वादशाहं द्वादशाहानि वीक्षितो भवति. यन्निय एव तैर्भवति द्वादश रात्रीरुपसव उर्पेति. शरीरमेव तामिधुनुते. द्वादशाह प्रमुते भूत्वा शरीरं धूत्वा शुद्धः पूनो देवता अप्येति. य एवं वेद. षट्त्रिंशदहो वा एष यद्द्वादशाह ।

"The Dvādaśāha consists of thrice three days together with the tenth day and two Atirātra days. After having undergone the ceremony of initiation during twelve days one becomes fit for performing the sacrifice. During the twelve days he undergoes the *Upasad* or the vow of fasting. By means of them he shakes off all guilt from his body. He who has such a knowledge becomes purified and clean, and enters the deities after having, during (these) twelve days, been born anew and shaken off (all guilt) from his body. The Dvādaśāha consists (on the whole) of thirty-six days."

The thirty-six days referred to in this passage are three sets of twelve days each, constituting the difference between three lunar and three sidereal solar years. The *Atharvaṇa* la = (Rig. v. vii 103. 1.) IV. 15. 13, also speaks of the twelve days' vow as follows:—

सवत्सरं शशयानां ब्रह्मणो व्रतचारिणः ।

वाचं पर्जन्यजिन्वितां प्रमदंका अवविष्टुः ।

"Having lain for a year, (like) Brāhman performing a vow, the frogs have spoken forth a voice quickened by *pa-janya* [the raining clouds]"

So also the same says IV. 11. 11:—

द्वादश वा एता रात्रीर्ब्रह्मणाः प्रजापते ॥

तत्रोप ब्रह्म यो वेद तद्वा अननुहो व्रतम् ॥

"Twelve, indeed, they declare those nights of the vow of Prajāpati, whose knows the *Brāhman* within them—that verily is the vow of the draught-ox."

The release from Varuṇa's fetters at the close of twenty-one days is thus referred to in the *Atharvaveda*, iv. 16. 6:—

ये ते पाशा वरुण सप्त सप्त त्रेधा तिष्ठति विषिता रुशंत ।

सिन्तु सर्बे अनृतं वरंतं यः सत्यवद्यति तं सृजतु ॥

"What fetters of thine, O Varuṇa, seven by seven, stand triply relaxed, shining—let them all bind him that speaks untruth, whose is truth-speaking, let them let him go."

I presume that the expression of three times seven milch kine pouring their milky draught, as referred to in the two verses of the *Sāmarveda* quoted above, implies the same idea as that of an intercalated period of twenty-one days. From the consideration of these and other similar passages too numerous to be quoted here, we may conclude that expressions such as 'the milking of the kine,' 'the destruction of evil spirits or of enemies,' and 'the release from the fetters of Varuṇa or of Nirṛiti,' are Vedic expressions implying the passing off of an intercalated period.

I think that the symbolical acts of cutting off the branch of a Palāśa tree, and of separating the calves from the cows for the purpose of milking them during the night, and of destroying the evil spirits and enemies, as described in the very beginning of the Black Yajurveda, are also meant to signify the passing off of an intercalated period. Among the Chinese the twelve months of the year are called the twelve branches; and it is probable that the Vedic poets, too, called the months, whether ordinary or intercalary, by the name of *śākhās* or branches. As already pointed out in the above pages and also in my essay entitled *Gavām-Ayana: the Vedic Era*, published in 1908, the term 'cow' is a name given to the New Year's Day as well as to the intercalated day; and her 'calves' must therefore mean the days of the subsequent year or cycle of years. We have also seen how the symbolical act of burning the evil spirits and enemies signifies the passing off of an intercalated period. Accordingly the first two *Anuvāks* or paragraphs of the first *kāṇḍa* of the Black Yajurveda may possibly refer to the cutting off of an intercalated branch or month, and to the separation of some New Years' Days or bissextile intercalated days, termed 'cows,' from their calves or the consecutive days of the subsequent year or cycle of years. In order to see whether the passage gives this meaning or not, it is necessary that we should examine the interpretation given to it by Bhaṭṭa Bhāskara and other commentators. The passage runs as follows, i. 1. 1:—

इषे स्वोर्जे स्वा वायवस्थोपायवस्थ देवो वस्त्वित्ता प्रार्पयतु श्रेष्ठघतमाय कर्मणे आप्यायध्वमद्विया देवभाग-
मूर्जस्वतीः पयस्वतीरनमीवा अयक्ष्मा मावस्तेन इक्षत माघशंसः रुद्रस्य हेतिः परि वो वृणक्तु ध्रुवा अस्मिन्गोपती
स्यात् बह्वीर्यजमानस्य पशून्पाहि (1). य इत्ययं घोषिदसि प्रत्युष्टं रक्षः प्रत्युष्टा अरातयः,

In accordance with the commentary of Bhaṭṭa Bhāskara and others on these passages, they can be translated thus:—

"O Branch, thou art for *isha* [food], and for *ūrja* [strength]; O calves, ye are swift runners like the wind, and ye come back again; O cows, may the bright sun lead you for the purpose of our best sacrificial rites; O inviolable cows, yield the share of the gods, ye who are possessed of strength, milk, and calves, and who are free from consumption and other diseases. May the thief have no power over you; may the slaughterer not touch you; may the thunderbolt of Rudra quit you on all sides; be ye firm in the possession of this cowherd; preserve ye the numerous cows of the sacrificer; O sword, thou art the announcer of the sacrifice; burnt is the devil and burnt are the enemies."

Here the sacrificer is required to repeat the first four words of the original, and to cut off a branch of the Palāśa tree for use in the sacrifice. The next four words are addressed to calves which are to be separated from their mothers, the cows. The following sentences up to 'burnt is the devil' are addressed to cows. Then comes the symbolical act of burning the evil spirits and enemies. These symbolical acts, which are usually performed by sacrificers in connection with all full-moon and new-moon sacrifices, appear to render the explanation of the commentators plausible and perhaps representative of the only meaning intended by the poet. But when we try to make the detached thoughts and acts into a connected whole, we feel the difficulty. So long as we accept the interpretation of the commentators, we fail to understand the aim of the poet who gave expressions to these thoughts and devised the symbolic acts: the thoughts and acts are so disconnected that they appear to have originated in some disordered mind. But if we take the 'branch' in the sense of an intercalated month which is to be placed between the months of *Isha* and *Ūrja* (*Āśvina* and *Kārttika*) and is to be symbolically burnt as an evil spirit and an enemy, and if we take the calves as the days of an ordinary year whose wife is elsewhere said to be the eighth day of the dark half of the month of *Māgha* and is called a cow bringing forth the days or calves of the next year, the disjointed thoughts arrange themselves into a connected whole. It is probable that it was the lack of proper astronomical terms to designate the various parts of the year that led the Vedic poets to talk of them in terms of the branches of a tree and cows and calves.

Whether or not the meaning of the first two paragraphs of the *Kṛishṇa-Yajurveda* is, as I have presumed it to be, this much is certain, that the Vedic poets were quite familiar with various kinds of years and knew how to adjust them with each other, and that the detailed description of calendars given in the *Sûtras* is but a copy of Vedic calendars and not a later invention.

II.—The Calendar.

Having thus proved the existence of a calendar during the Vedic times, I may now proceed to frame that calendar and its various forms out of the materials scattered here and there in the *Sûtras* and *Brâhmanas*. The general name by which the various forms of the Vedic calendar were known seems to have been *Gavâm-Ayana*. It is only one of many forms of the Vedic calendar that I attempted to explain in my essay entitled '*Gavâm-Ayana, the Vedic Era*', published in 1908. Therein I have pointed out: (1) that the word *gô*, 'cow,' means the intercalary day, i.e., that day which is the product of the four quarter-days at the end of four successive solar years, each of $365\frac{1}{4}$ days; (2) that the term *Gavâm-Ayana* or "Cows' Walk" means a series of such intercalary days, on each of which the Vedic poets regularly performed cyclic sacrifices; and (3) that in the *Mahad-Uktha* or Great Litany of *Rîgvêdic* hymns they kept a record of 460 or 465 intercalated days as having elapsed.

As the evidence I adduced in support of this theory is of an indirect and hypothetical nature, scholars have hesitated to accept it, and have opined that the passages which I explained in the light of this theory could bear other and perhaps more rational interpretations, and that my theory was rather an ingenious contrivance than a discovery of the real design of the Vedic poets. Probably no theory that is not based upon direct evidence is ever accepted; mine can be no exception, and would share the fate of other theories if, like them, it had no direct evidence to support it. But the *Niddâna-Sûtra* of the *Sâma-rêda* seems to supply the want. From this *Sûtra* we learn that *Gavâm-Ayana* is a name given to the year which contained some intercalated days inserted either in its middle or at its close. It appears that the number of days intercalated differed with different schools of Vedic astronomers, and depended upon the difference between any two kinds of years selected for adjustment with each other. The school which had adopted the synodic lunar year of 354 days and the sidereal solar year of 366 days seems to have added to every lunar year a *Drâdaśâha* or period of twelve days, during which they performed a sacrifice with recitation of a *Sâma*-chant of twelve verses on the last day. With the school which had adopted the sidereal lunar year of 351 days, i.e., the year of thirteen months of 27 days each, and adjusted it with the *Sâvana* year of 360 days, the number of days added was nine. Those who had adopted the *Sâvana* year of 360 days and adjusted it with the solar year of $365\frac{1}{4}$ days, seem to have been adding 21 days to every fourth *Sâvana* year. In this way there seems to have been during the Vedic period a variety of different astronomical schools, whose chief religious function was the performance of a grand sacrifice during each period of their respective intercalary days. A regular account of the 'cows' or intercalary days which each school counted and observed is found preserved under the general title of *Gavâm-Ayana*, "the walk of cows or intercalary days." The term *Gavâm-Ayana* seems to have been originally intended to be a name of only the intercalary days; but in the course of time it appears to have also been used to signify that year which contained intercalary days added to it, no matter whether the number of days so added, or counted as having been added, amounted to a year or more than a year. These and other important points connected with the Vedic calendar are clearly explained both in the *Niddâna-Sûtra* and in the *Srauta-Sûtra* of *Lâtyâyana*; and it is a matter for regret that, important as these works are for elucidating the much-vexed question of Vedic chronology, they have so long escaped the notice of oriental scholars. It is true that the *Sûtras* in general abound in elliptical and technical obscurities which sometimes render their meaning uncertain and vague; still, so far as their main idea or purport is concerned, they leave us in no doubt whatever.

The passage of the *Niddna-Sātra* in which a few forms of Gavām-Ayana are defined, runs as follows, v. 11, 12 :—

¹⁰ अथातस्संवत्सरा वर्गाणां पंचसंवत्सरा वर्गा ¹¹ तेषु धीरो मनीषया कर्मण उपससो विद्यात् सस्था वा एषु व्रतानि च. षट्विंशतिर्नो नवोनश्च षडहोनाऽथ सावनोऽष्टादशभिर्ज्यायानहोभिः सावनात्परो नाक्षत्रमिति मासश्च तस्य चैव त्रयोदश. चांद्रमसस्सावनश्चोभावथाष्टादश्युत्तमोऽष्टा समविंशते पौर्णमास्यां प्रसाधयेत् ।

गवामयनस्योपायांश्चतुरः प्रतिपादयेत्, तेषां नाक्षत्रः प्रथमस्तस्य सप्त विंशतिर्नो मासाः सप्तविंशतिर्नश्चार्णीति. तस्य कल्पः. प्रथमस्य प्रथमाभ्युदयस्य स्थाने त्रिकटुकव्यहं कुर्यात्प्राग्विषुवत उत्तमस्यात्तमस्यांर्ध्वं विषुवत ते खल्वभिप्रवतत्र एव कृमाः स्युरित्येकै. एते चाधिकृता न चापि निवर्तयत्यथापि वृश्यते व्यहस्यहतत्रे कृमा यथा स्वरसामान-
त्रिकटुकपंचादचाभिप्रवतत्रेः सप्तदशरात्रे । स्वरतत्रा इत्यपरम्. एव च तत्राविलोप अपि च सत्रेषु त्रिकटुकव्यह स्वतत्रो भवति.

अथ नवोनस्तस्यैव त्रयोदश मासाः सभार्ययोर्मासयोर्नवाह लुपेच्चतुरहमेव प्राग्विषुवतः पंचाहमूर्ध्वं तस्य कल्पः प्रथमस्याभिप्रवस्य स्थाने ज्योतिषं च गां च कुर्यात्प्राग्विषुवत ऊर्ध्वं विषुवत उत्तमस्याभिप्रवस्य स्थाने ज्योतिषं नात्र विषुवानभिभवत्युत्तरेऽत्र पक्षसि विषुवानुपसंख्यायत इति.

अथ षडूनाश्चांद्रमसा षट्पौर्णोपक्रमाः ऊनावसाना पूर्वे पक्षसि मासास्यः ऊनोपक्रमा पूर्णावसाना उत्तरे. तस्य कल्पः. प्रथमस्य प्रथमाभ्युदयस्य स्थानेऽभिप्रवपंचाह कुर्यात्प्राग्विषुवत ऊनं मासेषु उत्तमस्यात्तमस्यांर्ध्वं विषुवत ।

व्याख्यातस्सावनः । स एष आदित्यसंवत्सरो नाक्षत्र आदित्य खलु शरवर्गनावज्जिहोभिर्नक्षत्राणि समवेति-
त्रयोदशाह त्रयोदशाहमेकैक नक्षत्रमुपतिष्ठत्यहस्ततीयं च नवधा कृतयोरहोरात्रयोर्द्वे द्वे कालं चेति सावत्सरास्नात्र-
तुषपचाशत कला ते षण्णववर्गा स षट् षष्टिविंशत षष्टिविंशते । इलोकौ भवत --

सप्तविंशती राट्स्य राज्ञो वसतयो मिता ।

त्रयोदशाह त्रयोदशाहमेकैकं नक्षत्रमुपतिष्ठति ॥

त्रयोदशाहानि तृतीया महद्द्व्यतस्रस्त्रेधा दशतयो विकुर्वन् ।

त्रिणव पथान विनत पुराण चत्वारिंशता नवरात्रिस्समनुने ॥ इति.

अथाष्टादशभिर्ज्यायानादित्यसंवत्सर एव तैर्योगयनिको भवति. आदित्यः खलु शरवर्गकृत् पणमासानुवङ्कुर्वन् नव चाहानि तथा वक्षिणा. तदप्येते इलोकौ भवति.—

दस्मिन्ने परिवत्सरे

सौम्या मासोऽथ चांद्रमसो ।

नाक्षत्रो न विलुप्यते

कस्मिन्ने वेद क स्मिन् ॥

अष्टासप्तविंशते तस्मिन्

संवत्सरे मिते ।

सौम्यो मासोऽथ चांद्रमसो

नाक्षत्रो न विलुप्यते ॥

सप्तविंशतिर्मेवैष समा हानति वक्षिणा ।

तथोदङ् समविंशतिमिति ॥

तस्य कल्पः सभार्ययोर्मासयोर्नवाहान्युपाहर्नवाहमेव प्राग्विषुवतः नवाहमूर्ध्वं त्रिकटुकाश्चाभिप्रव च प्राग्विषुवतोऽभिप्रव च त्रिकटुकाश्चावृत्तानुर्ध्वं विषुवत ।

Then the years of the classes ¹¹ the classes (*or*) of five years. In them the sage by his wisdom will know the sessions of the ritual,¹² and the basic forms (*of the sacrificial rites*),¹³ and the vows or ceremonies (*to be observed*) in them.

¹⁰ From पंच to सावनात्परो (for र्) —and perhaps farther—seems to be a metrical quotation from some other work with one or two words separated, and one omitted.—J. F. Fleet

¹¹ *Varja* is not fairly to be rendered by 'cycle'. Cycle is *yuga* or *chakra*. *Varja* is a 'group, class'.—J. F. Fleet

¹² *Upasad* lit. 'the sitting down, waiting for the arrival of the final sacrificial day'

¹³ *Samsthā*, lit. 'a standing or abiding together.'

" (The year) which is less (than the *Sāvāna year*) by 36 (days); that which is less by 9 (days); that which is less by 6 (days); then the *Sāvāna year* (of 360 days), then the year which is greater than the *Sāvāna year* by 18 days. The sidereal year (of 351 days) has a thirteenth month (of 27 days). Then the two kinds of years: the lunar and the *Sāvāna*. Then the year which is greater than the *Sāvāna year* by 18 days: one has to observe (it) on every 38th or 37th full-moon.

"He has to know the four forms of *Gavām-Ayana*. Of them, the sidereal year (of 324 days) is the first; its months are of 27 days each, because there are 27 *nakṣatras*. The mode of observing it (is this): in the place of each first [period of six days called] *Abhiplava* (of every month of 30 days) before the central day (of the year), one should observe [a period of only three days known as] *Trikadrūka*¹⁴ (likewise in the place) of each last (*Abhiplava*) after the central day. Some say that they (the *Trikadrūka days*) are so devised as to be of the same form as the *Abhiplava* days; they have their place here; nor is their observance opposed to that of the *Abhiplava* days. It is also known that, like the *Svarasāman* days,¹⁵ the unit of three days [the *Trikadrūka days*] is devised as a special period of three days. The three *Trikadrūka* days, as well as the five days of the six *Abhiplava* days are observed together in the sacrificial session of seventeen nights.¹⁶ Others say that the *Trikadrūka* days are the same as the *Svarasāman* days. And thus the usual form of the calendar days and their rites is not lost, for the *Trikadrūka* days have their own independent place in all sacrificial sessions.

"Then (the year of 351 days) which is less (than the *Sāvāna year*) by nine days:¹⁷ thus it has thirteen months (each of 27 days). He has to omit nine days in the two intercalary months [*sambhārga*],¹⁸ i.e. the sixth and the seventh month, each of 30 days]. Four days (are to be omitted) before the central day of the year, and five days after it. This is how it is done: in the place of the first *Abhiplava* (of the sixth month of 30 days) before the central day, only two days known as *gyōtis* and *gōs*, are to be observed, and in the place of the last *Abhiplava* (of the seventh month) after the central day, only one day, known as *gyōtis*, is to be observed. No central day occurs in the year (of 351 days), for it is counted in its latter half.

"Then the lunar years (of 354 days) which are less (than the *Sāvāna year*) by six days:¹⁹ in the first half (of this year) there are six months, beginning with one which is full [i.e., consists of 30 days] and ending with one which is deficient [i.e., contains only 29 days], in the latter (half) there are six months, beginning with one which is deficient and ending with one which is full. This is how it is observed: in the deficient months before the central day, in the place of each first *Abhiplava* one should observe (only) five days of *Abhiplava*. (like use in the place) of each last (*Abhiplava*) in the deficient months after the central day.

¹⁴ *Trikadrūka* is the name given to a unit of three days, of which the first day is called *gyōtis*, 'light', the second *gōs*, 'dawn', and the third *gyōtis*, 'life'. *Abhiplava* is the name given to a unit of six days, of which the first three days are named like the *Trikadrūka* days and the last three days are called *gyōtis*, *gyōtis*, and *gyōtis*.

¹⁵ *Svarasāman* is a name given to the three days before and after the central day of a sacrificial session. Special *Sāma*-chants are sung on these six days. If the *Trikadrūka* days were considered as identical with the *Svarasāman* days, which are strictly observed immediately before and after the central day of a sacrificial session, the other days of the session would be counted in periods of six days each. This appears to be the meaning of 'an independent place for the *Trikadrūka* days'.

¹⁶ The 17 nights seem to me to be the nights of 6 *Svarasāman* days plus 6 *Trikadrūka* days plus 5 *Abhiplava* days.—J. F. Fleet

¹⁷ See Calendar, Form II. below.

¹⁸ [I do not see how *sambhārga* can be fairly rendered by 'intercalary'. It means 'that which may be brought together', and seems to mean, rather, 'the two months which are susceptible of contraction by shortening'.—J. F. Fleet.]

¹⁹ See Calendar, Form III. below.

"The *Sāvāna* year (of 360 days)²⁰ has been explained. It is this same sidereal year of the sun.²¹ The sun is known to pass through (each of) the *nakṣhatras* in a fixed number of days: he remains in each *nakṣatra* for thirteen and thirteen days, together with a third part of a day and two out of nine *kalds* or parts of a day-and-night [*i. e.*, of a whole day]: these *kalds* or parts amount in a year to 54, and are equal to six times nine *kalds* [*i. e.*, 6 days]: thus it consists of 366 (days) as contrasted with the (*Sāvāna* year) consisting of 360 (days). There are two verses about this:—

"Twenty-seven are the mansions in the king's [*i. e.*, the Sun's] dominion, thirteen and thirteen days he resides in each *nakṣatra*: thirteen days and one-third of a day; thus dividing four times ten days into three (equal) parts, he traverses the broad and ancient path of thrice nine stations in the course of forty periods, each of nine nights."

"Then the year of the sun (of 378 days)²² which is greater (than the *Sāvāna* year) by eighteen days; this indeed is made by his transverse motion,²³ it is well known that the sun always goes to the North for six months and nine days, and likewise to the South. Accordingly there are the following verses:—

"Who knows that year in which the solar, the lunar, and the sidereal months are not lost, who knows that? In the year measured by 37 or 38 (full-moons), the solar, the lunar, and the sidereal months are not lost. The sun goes to the South for twenty-seven times seven days, and likewise to the North for twenty-seven times seven days.

"This is how this year is observed:—In the two intercalary months,²⁴ one should intercalate eighteen days; nine days before the central day of the year and nine days after it; three *Trikadruka* days and six *Abhiplava* days before the central day, and six *Abhiplava* days and three *Trikadruka* days after the central day."

Similar forms of calendar, together with some more varieties, are also described in the *Śrauta-Sūtra* of Lāṭyāyana, iv. 8, 1—7. This is what he says:—

उद्योतिषामयनं चिक्रुवाः । तत्र यथावितोऽन्ततस्तद्वर्षे विप्रवतः । मासि मास्याद्यस्याभिप्रवस्य स्थाने
चिक्रुद्रुका । स षट्विंशतूर्वा नाक्षत्रस्तसर्विंशिनो हि मासाः । षष्ठाद्यस्याभिप्रवस्य स्थाने उद्योतिर्गोत्रं उद्यो-
तिरेवाहुते स नवौना नाक्षत्र एव त्रयोदशी । शुभमासेष्वद्याद्यस्याभिप्रवस्य स्थाने तत्पंचार स षडूनश्रो-
द्रमसः । षष्ठादौ चिक्रुद्रुकानभिप्रवत् चोपध्यात् सोऽष्टादशाधिकः पौर्णमासीप्रसवस्तैवेगयति स उदित्यस्य ।

"Varieties of the movements of the heavenly luminaries. In the calendar pertaining to these movements, that which is observed at the beginning (of each month) before the central day, is observed at the close (of each month) after the central day. In the place of the first six *Abhiplava* days in each month, only three *Trikadruka* days are observed. Thus this sidereal lunar year is less (than the *Sāvāna* year) by 36 days, since its months consist of 27 days each.

"In the place of the first six *Abhiplava* days of the sixth month (of the *Sāvāna* year), there are observed only two days, known as *ṛṇōts* and *gō*, and in the second part of the year, which is

²⁰ See Calendar, Form I, and for the year of 563 days, see Form IV below.

²¹ [The text treats here in a somewhat obscure manner of both the *Sāvāna* year of 360 days and the sidereal solar year of 366 days. The latter is not mentioned as one of the five classes of years in the beginning of the passage. The text seems to suggest that the *Sāvāna* year, before being regarded as = 30 days × 12, was a sidereal year of 27 × 13½ days, and that the year of 366 days, = 27 × 13½, was a refinement of it, as a result of experience showing that the sun required ½ of a day more time to pass through each *nakṣatra*.—J. F. Fleet.

²² See Calendar, Form IV. below.

²³ The motion from South to North and back again, which the sun seems to have in passing from solstices to solstices, is transverse, at right angles, to his actual motion from West to East through the *nakṣhatras*.—J. F. Fleet.

²⁴ See Note 18, above.

merely a repetition of the first part, or, only one day, known as *gyāna*, is observed in the place of the last six *Abhiplava* days (of the *sev-enth* month); thus it is less (than the *Sāvana* year) by nine days, and is a sidereal year having a thirteenth month.²⁵

"In the place of the first six *Abhiplava* days in all the even months, only five *Abhiplava* days are observed; this is less (than the *Sāvana* year) by six days, and is lunar.²⁶

"In the beginning of the sixth month, one should intercalate three *Triakadruka* days and six *Abhiplava* days,²⁷ thus it is greater (than the *Sāvana* year) by 18 days, and is productive of a full-moon; and it is caused by the transverse motion of the sun."²⁸

Besides the three forms of calendar mentioned above, which are similar to those described in, the *Niddna-sūtra*, a few more varieties also are noticed in the *Lāṭyāyana Śrauta sūtra*. As some of these varieties are referred to, though only briefly, in the *Krishna-Yajurveda*, it need not be said that they existed during the Vedic period, and that they are not the later contrivances of *Sūtra* writers. It is therefore necessary that we should understand them as clearly as possible. The *Lāṭyāyana-Sūtra* continues in iv. 8, 8-20:—

उत्सर्जनानि मासि मासि । यथाऽन्त एवमावृत्तानामादिः । पूर्वेष्वभिष्वेषु षष्ठमहरुक्त्यं कृत्वाऽ-
ग्निष्टोममुत्तमे । तद्वैकत्रिकस्तोमम् । सवनविधं पशुं कुर्वन्नुत्तममभिष्ववंपंचाहं कृत्वा षष्ठ्याग्ने सवनविधं ।
पशुः । प्रथममभिष्ववं पंचाहं कृत्वा मासान्ते सवनविधः पशुः । सर्वानुनात्नेके प्रथममभिष्ववंपंचाहं
कुर्युः । अहनी वा समस्येयुग्मभिष्ववृत्त्यष्टौ सत्रिगतौ । अभिष्वव्योरुत्तमे । तथा सत्येकादश्यां पूर्वपक्षस्य
सीनिष्ठा त्रयोदशीनां कुर्वन्ति । समदश वा । व्यत्यासं वा पूर्वोत्तमानुपूर्वानावृत्तान् शालं-
कायन्ति ।

"Omissions (of days) month after month.²⁹ Just as the last day (in each month in the first half of the year) is omitted, so the first day (in each month) in the repeated part of the year [i.e. the second part] is omitted. Having treated as *Ukthya* days the sixth day in each of the three *Abhiplava* periods of six days, they observe the sixth day of the last *Abhiplava*, [i.e., the fourth *Abhiplava*] as an *Agnishtoma* day.³⁰

"On the sixth day of the fourth *Abhiplava* period of each month, they have to recite a set of *Sāma*-verses called *Ekatrika*.³¹ In view of immolating a sacrificial animal, they make the last (i.e., the fourth) *Abhiplava* consist of only five days, and immolate a sacrificial animal on the sixth day. Having made the first *Abhiplava* consist of only five days, they immolate a sacrificial animal at the close of the month. Some teachers make all the months deficient by one day: they make the first *Abhiplava* of each month consist of only five days.³² At the junction of *Abhiplava* and *Prishthya* days,³³ they reckon the last day of the (fourth) *Abhiplava* period and the first day of the *Prishthya* as one day [i.e., they treat the two as a single day]. In the last month [i.e., the twelfth month], they make the last day of the last but one *Abhiplava* the first day of the last:

²⁵ See Calendar, Forms I and II

²⁶ *Ibid.*, Form III.

²⁷ That is, nine days before the central day and nine days after it

²⁸ See Calendar, Form IV.

²⁹ This is what is called *utsarjanām ayanam*, which is described in the *Krishna-Yajurveda*, VII 5, 6.

³⁰ It should be noted here that according to this school a month is made to consist of four *Abhiplavas* of six days each and a *Prishthya* of six days closing the month. According to the commentary of *Agnisvāmin* on this *Sūtra*, it is the *Ukthya* days that are omitted. Accordingly, three days are omitted in each month, thus making it consist of 27 days. See Calendar, Form V, below

³¹ *Agnisvāmin* quotes a passage on the authority of which the day with the *Ekatrikastōma* is omitted. Hence, according to this school, the month seems to consist of only 29 days. See Calendar, Form VI, below

³² See Calendar, Form VII, below

³³ Like *Abhiplava*, *Prishthya* is also a name given to a period of six days which are called (1) *Rathāntara*, (2) *Brihat*, (3) *Varūpa*, (4) *Vairāja*, (5) *Śākvara*, and (6) *Ravati*, after the names of the *Sāma*-verses recited on those days. In some schools, the last six days of each month are observed as *Prishthya*.

Abhiplava.³⁴ If so [*i.e.*, if they omit one day in each month of the year], they should undergo the vow of initiation for their sacrifice on the eleventh day of the bright half of the month, and spend thirteen days in vow (before they perform their sacrifice on the fourteenth, *i.e.*, the *Ekāshṭakā* day of the dark half of the month). Or they have to spend seventeen days in vow.³⁵

Calendar—Form I.

[Abbreviations · J = *jyōtiḥ*; G = *gā*; Ā = *āyus*.]

Sāvana Year of 360 Days.

1st Month.					
		J.	G.	Ā.	J.
Abhiplava I	... ..	1	2	3	4
„ II	... ..	7	8	9	10
„ III	... ..	13	14	15	16
„ IV	... ..	19	20	21	22
„ V	... ..	25	26	27	28
2nd Month					
		J.	G.	Ā.	J.
Abhiplava I	... ..	1	2	3	4
„ II	... ..	7	8	9	10
„ III	... ..	13	14	15	16
„ IV	... ..	19	20	21	22
„ V	... ..	25	26	27	28

³⁴ The twelfth month, when recast in the form of *Gavām-Ayana*, consists of three *Abhiplavas* of six days each and a period of *Dhāda śha* or twelve days. In order to make this month also consist of 29 days, they make the last day of the second *Abhiplava* the first day of the third *Abhiplava*. See Calendar, Form VIII.

³⁵ As each month of the year is made to consist of 29 days (total 348), the deficiency in the year amounts to twelve or seventeen days according as we take the Sāvana year of 330 days or a solar year of 365 days for comparison. It is clear, therefore, that the twelve or seventeen days regarded as *Nikshā*-days are no other than intercalary days required to make up the year in observance. Compare *Astarāya-Brahmaṇa* iv, 4, 24; and *Atharvayajūḥ*, iv, 11, 11, iv 15, 13, and iv, 13, 6, quoted above.

3rd Month.									
			J	G	A	G	A	J	
Abhiplava I	.	.	1	2	3	4	5	6	
" II	..	...	7	8	9	10	11	12	
" III	...		13	14	15	16	17	18	
" IV	..	...	19	20	21	22	23	24	
" V	.	...	25	26	27	28	29	30	

4th Month									
			J	G	A	G	A	J	
Abhiplava I	...	...	1	2	3	4	5	6	
" II	.	...	7	8	9	10	11	12	
" III	.	..	13	14	15	16	17	18	
" IV	...	..	19	20	21	22	23	24	
" V	.	...	25	26	27	28	29	30	

5th Month									
			J	G	A	G	A	J	
Abhiplava I	..	..	1	2	3	4	5	6	
" II	.	.	7	8	9	10	11	12	
" III	.	..	13	14	15	16	17	18	
" IV	..	.	19	20	21	22	23	24	
" V	.	..	25	26	27	28	29	30	

6th Month

				J.	G.	Â.	G.	Â.	J.
Abhiplava I	...	..	..	1	2	3*	4*	5*	6*
„ II	...	...	..	7	8	9	10	11	12
„ III	...	...	..	13	14	15	16	17	18
„ IV	...	...	..	19	20	21	22	23	24
„ V	...	...	..	25	26	27	28	29	30†

7th Month

				J.	G.	Â.	G.	Â.	J.
Abhiplava I	..	..	..	1	2	3	4	5	6
„ II	...	...	..	7	8	9	10	11	12
„ III	...	...	..	13	14	15	16	17	18
„ IV	...	..	..	19	20	21	22	23	24
„ V	...	..	...	25*	26*	27*	28	29*	30

8th Month

				J.	G.	Â.	G.	Â.	J.
Abhiplava I	..	...	..	1	2	3	4	5	6
„ II	...	...	...	7	8	9	10	11	12
„ III	...	...	...	13	14	15	16	17	18
„ IV	...	..	...	19	20	21	22	23	24
„ V	...	...	...	25	26	27	28	29	30

* In order to convert this year into the sidereal lunar year of 351 days, the days marked with an asterisk in the 6th and 7th months are omitted. See also Calendar, Form II.

† This is the Vishuvat or central day of the year.

N.B.—Instead of being called *Abhiplava*, the last week in each month seems to have been called by others, as *Prishthya*, the days being named Rathantara, Brihatî, Vairûpa, Vairûja, Sukvara, and Raivata respectively.

9th Month

				J	G.	A	G.	Ā	J
Abhiplava I	...	...	.	1	2	3	4	5	6
„ II	...	...	..	7	8	9	10	11	12
„ III	...	..		13	14	15	16	17	18
„ IV	...	...	..	19	20	21	22	23	24
„ V	...	..	...	25	26	27	28	29	30

10th Month

				J	G	A	G	Ā	J
Abhiplava I	..	..	..	1	2	3	4	5	6
„ II		.	.	7	8	9	10	11	12
„ III	..	..	..	13	14	15	16	17	18
„ IV	.	.	.	19	20	21	22	23	24
„ V	..		...	25	26	27	28	29	30

11th Month

				J	G	A	G	Ā	J
Abhiplava I	..	.	.	1	2	3	4	5	6
„ II	...	.	..	7	8	9	10	11	12
„ III	...	...	.	13	14	15	16	17	18
„ IV	.	...	..	19	20	21	22	23	24
„ V	...		..	25	26	27	28	29	30

					12th Month.					
					• J.	G.	Â	G	Â	J
Abhiplava I	...	...	..		1	2	3	4	5	6
„ II	..	...	..		7	8	9	10	11	12
„ III	...	..	..		13	14	15	16	17	18
„ IV		..	..		19	20	21	22	23	24
„ V	...	...	..		25	26	27	28	29	30

Calendar—Form II.
Sidereal Lunar Year of 351 days.

					1st Month					
					J	G.	A	G	A	J.
Abhiplava I	.	...	.		1	2	3	.	...	.
„ II	...	...	..		4	5	6	7	8	9
„ III	...	...	...		10	11	12	13	14	15
„ IV	..	..	..		16	17	18	19	20	21
„ V	...	...	...		22	23	24	25	26	27

					2nd Month					
					J.	G	A	G	A	J.
Abhiplava I	...	...	..		1	2	3	...	...	...
„ II	...	...	..		4	5	6	7	8	9
„ III	...	...	...		10	11	12	13	14	15
„ IV	...	..	...		16	17	18	19	20	21
„ V	...	..	...		22	• 23	24	25	26	27

3rd Month.

	J.	G.	Â.	G.	Â.	J.
Abhiplava I	1	2	3	...	...	...
„ II	4	5	6	7	8	9
„ III	10	11	12	13	14	15
„ IV	16	17	18	19	20	21
„ V	22	23	24	25	26	27

4th Month

	J.	G.	Â.	G.	Â.	J.
Abhiplava I	1	2	3	...	...	...
„ II	4	5	6	7	8	9
„ III	10	11	12	13	14	15
„ IV	16	17	18	19	20	21
„ V	22	23	24	25	26	27

5th Month.

	J.	G.	Â.	G.	Â.	J.
Abhiplava I	1	2	3	...	...	...
„ II	4	5	6	7	8	9
„ III	10	11	12	13	14	15
„ IV	16	17	18	19	20	21
„ V	22	23	24	25	26	27

6th Month.

				J.	G.	Â.	G.	Â.	J.
Abhiplava I	...	...	...	1	2	3	...	...	...
„ II	...	...	...	4	5	6	7	8	9
„ III	...	...	...	10	11	12	13	14	15
„ IV	...	...	...	16	17	18	19	20	21
„ V	...	...	...	22	23	24	25	26	27

7th Month.

				J.	G.	Â.	G.	Â.	J.
Abhiplava I	...	...	...	1	2	3	...	...	...
„ II	...	...	...	4	5	6	7	8	9
„ III	...	...	...	10	11	12	13	14	15
„ IV	...	...	...	16	17	18	19	20	21
„ V	...	...	...	22	23	24	25	26	27

8th Month.

				J.	G.	Â.	G.	A.	J.
Abhiplava I	...	...	...	1	2	3	...	...	...
„ II	...	...	...	4	5	6	7	8	9
„ III	...	...	...	10	11	12	13	14	15
„ IV	...	...	...	16	17	18	19	20	21
„ V	...	...	...	22	23	24	25	26	27

9th Month.

	J.	G.	Ā.	G.	Ā.	J.
Abhiplava I	1	2	3	...	...	...
„ II	4	5	6	7	8	9
„ III	10	11	12	13	14	15
„ IV	16	17	18	19	20	21
„ V	22	23	24	25	26	27

10th Month.

	J.	G.	Ā.	G.	Ā.	J.
Abhiplava I	1	2	3	...	...	...
„ II	4	5	6	7	8	9
„ III	10	11	12	13	14	15
„ IV	16	17	18	19	20	21
„ V	22	23	24	25	26	27

11th Month.

	J.	G.	Ā.	G.	Ā.	J.
Abhiplava I	1	2	3	...	...	...
„ II	4	5	6	7	8	9
„ III	10	11	12	13	14	15
„ IV	16	17	18	19	20	21
„ V	22	23	24	25	26	27

12th Month.						
	J.	G.	Ā.	G.	Ā.	J.
Abhiplava I	1	2	3	...	...	...
„ II	4	5	6	7	8	9
„ III	10	11	12	13	14	15
„ IV	16	17	18	19	20	21
„ V	22	23	24	25	26	27

Calendar—Form III.
Synodic Lunar Year of 354 days.

							1st Month.					
							J.	G.	Ā.	G.	Ā.	J.
Abhiplava I	...	...	...	...	...	...	1	2	3	4	5	6
„ II	...	...	...	...	...	...	7	8	9	10	11	12
„ III	...	...	...	...	...	...	13	14	15	16	17	18
„ IV	...	...	...	...	...	...	19	20	21	22	23	24
„ V	...	...	...	...	...	...	25	26	27	28	29	30
2nd Month.												
							J.	G.	Ā.	G.	Ā.	J.
Abhiplava I.	...	...	...	...	...	...	...	1	2	3	4	5
„ II	...	...	...	...	...	...	6	7	8	9	10	11
„ III	...	...	...	...	...	...	12	13	14	15	16	17
„ IV	...	...	...	...	...	...	18	19	20	21	22	23
„ V	...	...	...	...	...	...	24	25	26	27	28	29

3rd Month.

				J.	G.	Â.	G.	Â.	J.
Abhiplava I	...	...	...	1	2	3	4	5	6
„ II	...	...	..	7	8	9	10	11	12
„ III	...	...	..	13	14	15	16	17	18
„ IV	...	...	...	19	20	21	22	23	24
„ V	...	...	...	25	26	27	28	29	30

4th Month.

				J.	G.	Â.	G.	Â.	J.
Abhiplava I	...	...	...	...	1	2	3	4	5
„ II	...	.	...	6	7	8	9	10	11
„ III	..	..	..	12	13	14	15	16	17
„ IV	...	...		18	19	20	21	22	23
„ V	...	...	..	24	25	26	27	28	29

5th Month.

				J	G.	Â	G	Â	J.
Abhiplava I	...	...	..	1	2	3	4	5	6
„ II	...	...	...	7	8	9	10	11	12
„ III	...	...	..	13	14	15	16	17	18
„ IV	...	...	...	19	20	21	22	23	24
„ V	...	...	...	25	26	27	28	29	30

6th Month									
				J.	G.	Â	G.	Â.	J.
Abhiplava I	...	...	...	...	1	2	3	4	5
„ II	...	...	...	6	7	8	9	10	11
„ III	...	...	...	12	13	14	15	16	17
„ IV	...	...	...	18	19	20	21	22	23
„ V	...	...	...	24	25	26	27	28	29

7th Month.										
					J	G.	Â.	G.	Â	J
Abhiplava I	...	...	...		1	2	3	4	5	6
„ II	...	...	..		7	8	9	10	11	12
„ III	...	...	...		13	14	15	16	17	18
„ IV	...	...	..		19	20	21	22	23	24
„ V	...	...	...		25	26	27	28	29	30

8th Month.									
				J.	G.	Ā.	G	Ā	J.
Abhiplava I	...	...	...	1	2	3	4	5	6
„ II	...	...	..	7	8	9	10	11	12
„ III	...	...	...	13	14	15	16	17	18
„ IV	...	...	...	19	20	21	22	23	24
„ V	...	...	...	25	26	27	28	29	...

9th Month.

				J.	G.	Â.	G.	Â.	J
Abhiplava I	...	...	..	1	2	3	4	5	6
„ II	...	...	..	7	8	9	10	11	12
„ III	...	...	..	13	14	15	16	17	18
„ IV	...	...	...	19	20	21	22	23	24
„ V	...	...	...	25	26	27	28	29	30

10th Month.

				J.	G.	Â.	G.	Â.	J
Abhiplava I	...	...	...	1	2	3	4	5	6
„ II	...	...	..	7	8	9	10	11	12
„ III	...	...	...	13	14	15	16	17	18
„ IV	...	...	...	19	20	21	22	23	24
„ V	...	...	..	25	26	27	28	29	...

11th Month.

				J	G	Â.	G.	Â.	J
Abhiplava I	...	...	..	1	2	3	4	5	6
„ II	...	..	.	7	8	9	10	11	12
„ III	...	...	..	13	14	15	16	17	18
„ IV	...	...	...	19	20	21	22	23	24
„ V	...	...	...	25	26	27	28	29	30

6th Month.

				J.	G.	Â.	G.	Â.	J.	J.	G.	Â
Abhiplava I	...	...		1	2	3	4	5	6	7	8	9
„ II	...	..		10	11	12	13	14	15	...	...	..
„ III	...	..		16	17	18	19	20	21	...	...	..
„ IV	...	...		22	23	24	25	26	27	...	...	...
„ V	..	...		28	29	30	31	32	33	...	...	...
„ VI	...	...		34	35	36	37	38	39*	40	41	42
„ VII	...	..		43	44	45	46	47	48	.		.

7th Month.

				J.	G.	Â.	G.	Â.	J
Abhiplava I	...	...	...	1	2	3	4	5	6
„ II	...	...	...	7	8	9	10	11	12
„ III	...	...	...	13	14	15	16	17	18
„ IV	..	...	...	19	20	21	22	23	24
„ V	...	...	..	25	26	27	28	29	30

8th Month.

				J	G.	Â	G.	Â	J.
Abhiplava I	...	...	...	1	2	3	4	5	6
„ II	...	...	...	7	8	9	10	11	12
„ III	...	...	...	13	14	15	16	17	18
„ IV	...	...	...	19	20	21	22	23	24
„ V	...	...	..	25	26	27	28	29	30

9th Month

	J	G.	Â.	G.	Â	J
Abhuplava I	1	2	3	4	5	6
„ II	7	8	9	10	11	12
„ III	13	14	15	16	17	18
„ IV	19	20	21	22	23	24
„ V	25	26	27	28	29	30

10th Month

	J	G	A	G	A	J
Abhiplava I	1	2	3	4	5	6
„ II	7	8	9	10	11	12
„ III	13	14	15	16	17	18
„ IV	19	20	21	22	23	24
„ V	25	26	27	28	29	30

11th Month

	J	G.	Â	G	A.	J
Abhiplava I	1	2	3	4	5	6
„ II	7	8	9	10	11	12
„ III	13	14	15	16	17	18
„ IV	19	20	21	22	23	24
„ V	25	26	27	28	29	30

THE VEDIC CALENDAR

12th Month.						
	J.	G.	Â.	G.	Â.	J.
Abhiplava I	1	2	3	4	5	6
„ II	7	8	9	10	11	12
„ III	13	14	15	16	17	18
„ IV	19	20	21	22	23	24
„ V	25	26	27	28	29	30

(i) The asterisk in the sixth month marks the Vishuvat or central day of the year.

(ii) Here, also, *Prishthya* days may have been substituted for *Abhiplava* days at the close of each month.

Calendar—Form V.

	1	2	3	4	5	6
Abhiplava I	J.	G.	Â.	G.	Â.	U.
„ II	J.	G.	Â.	G.	Â.	U.
„ III	J.	G.	Â.	G.	Â.	U.
„ IV	J.	G.	Â.	G.	Â.	Agni.
Prishthya I	R.	B.	V.	Vr.	S.	Rai.

Note.—Similarly the other months, only *Prishthya*, taking the place of the first *Abhiplava* in the second half of the year.

Calendar—Form VI.

	1	2	3	4	5	6
Abhiplava I	J.	G.	Â.	G.	Â.	J.
„ II	J.	G.	Â.	G.	Â.	J.
„ III	J.	G.	Â.	G.	Â.	J.
„ IV	J.	G.	Â.	G.	Â.	Ēkatrikâ.
Prishthya I	R.	B.	V.	Vr.	S.	Rai.

* This day is not counted ; similarly the other months.

Calendar—Form VII.

	1	2	3	4	5	6
Abhiplava I	O	G.	Â.	G.	Â.	J.
„ II	J.	G.	Â.	G.	Â.	J.
„ III	J.	G.	Â.	G.	Â.	J.
„ IV	J.	G.	Â.	G.	Â.	J.
Prishthya I .. .	R.	B.	V.	Vr.	S.	Rai.

Calendar—Form VIII.

Month 11	1	2	3	4	5	6
Abhiplava I	J	G.	Â.	G	Â.	J
„ II	J.	G	Â.	G.	Â.	J.
„ III	J.	G.	Â.	G.	Â.	J
„ IV	J	G.	Â.	G.	Â.	J.
Prishthya I	R.	B.	V.	Vr.	S.	Rai.

Calendar—Form VIII.

Month 12.	1	2	3	4	5	6
Abhiplava I	J.	G.	Â.	G.	Â.	J.
„ II	J.	G.	A	G.	A.	J.
„ III	J.	G.	A.	G.	A.	...
The Dvâdasâha	R.	B.	V.	Vr.	S.	Rai.
	C ¹	C ²	C ³	C ⁴	M.	U.

C¹ to C⁴ = Four Chândama days ; M = Mahāvṛata ; U = Udayantiya day.

Calendar—Form IX.

The sāvana year with twenty-one intercalary days inserted between the sixth and seventh months.

6th Month.				J.	G.	Ā.	G.	Ā.	J.
Abhiplava I	...	..	..	1	2	3	4	5	6
„ II	...	..	..	7	8	9	10	11	12
„ III	...	...	...	13	14	15	16	17	18
„ IV	...	...	..	19	20	21	22	23	24
Prishthya days	...	...	.	25	26	27	28	29	30

Abhijit	Six Prishthya days						Three Svarasāma days.			Central day.	Viśvajit.	Three Svarasāma days.			Six Prishthya days.					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

7th Month.				J.	G.	Ā.	G.	Ā.	J.
Abhiplava I	...	..	...	1	2	3	4	5	6
„ II	...	...	..	7	8	9	10	11	12
„ III	..	...	...	13	14	15	16	17	18
„ IV	...	...	...	19	20	21	22	23	24
Prishthya days	...	...	...	25	26	27	28	29	30

Names for the different kinds of years as suggested by Dr. J. F. Fleet :—

324 = 27 × 12	...	...	“Sidereal lunar year of 324 days.”
351 = 27 × 13	...	...	“Sidereal lunar year of 351 days.”
354 = 30 × 6 + 29 × 6	...	...	“Synodic lunar year.”
360 = 30 × 12 or 27 × 13½	...	...	The best possible term for this is the original one, “Sāvana year.”
366 = 27 × 13½	...	...	“Sidereal solar year”
378 = 189 + 189	...	...	“Pseudo-solstitial year of 378 days.”
365	...	...	“Vague solar year.”
365½	...	...	“Julian solar year.”—This term involves an anachronism but it is customary and explains at once what is meant

"The school of Sālaṅkāyanins observe full and deficient months alternately in the first half of the year, and deficient and full months alternately in the second half of the year."

These are some of the forms of the calendar kept by the Vedic poets. Of these: (1) the sidereal lunar year of 351 days, with 9 or 15 days intercalated according as it was to be adjusted to the sāvana year of 360 days or to the sidereal solar year of 366 days, (2) the synodic lunar year of 354 days, with 12 days intercalated to adjust it to the sidereal solar year, and (3) the cycle of three sāvana years each of 360 days, with 18 days intercalated in every third or fourth sāvana year for the purpose of adjusting it to the sidereal solar year of 366 days, are the principal forms which deserve our attention. The rest of the forms noticed in the Śrauta-Sūtra of Lāṭyāyana differ from each other in the rituals assigned to the days of the month.

The most important of these three principal forms is the synodic lunar year of 354 days, with the 12 intercalated days, or the Dvādaśāha period as it is usually styled in the Vedic literature. Regarding this addition of 12 days to the lunar year the Nidāna-Sūtra VI 6, says:—

सर्वेदेदसमिति. ते खल्वेते धर्मा एतस्मिन्नेव द्वादशाहे द्युरिति. गौतमोऽत्र हि संवत्सरसि वर्तति. ऊर्ध्वं द्वादशा-
हात् संवत्सरिकार्णवि धानंजप्यः

"As regards the gift of the entire property of the sacrificer:—These functions [i.e. the gifts of the entire property] are the marked features of the period of twelve days; for Gāutama says that it is here (*in the period of 12 days*) that the year is attained. And Dhānamjapya says that after the lapse of the twelve days the functions of the (*new*) year are begun."

This intercalary period of 12 days seems to have been inserted by some in the middle of the year and by others at its close. From the famous Atharvavēla, verse IV 15. 3 (see p. 3 above), it is clear that the period of 12 days, or the vow of 12 nights as it is styled therein, was added at the close of the year. As regards its insertion in the middle of the year, the Śrauta-Sūtra of Lāṭyāyana IV, 5. 3-5, furnishes clear proof: the passage runs as follows:—

अतिरात्रचतुर्विंश नवाहत्रततिरात्रा वा यथास्थानं द्युः सोषो ज्योतिष्टोमेन । अत्र वा गोभायुषी पृथ्याभिप्लवा-
द्वारात्रमित्युपाहरेत्. स संवत्सरप्रवर्हः । संखाहत्तं च ।

"An *Atirātra* day on which twenty-four Sāma verses are recited then the period of nine days then the day of Mahāvratā, and then the final *Atirātra* day, are severally observed in the respective places (*in the year*); the rest of the days of the year are observed in the *Jyōtiṣṭōma* way. Or one may insert the twelve days by treating two days as the days termed *gā* and *āyus*, and by observing the period of ten days as made up of six *Prishṭhya* days and four of the six *Abhiplava* days.³⁰ This period of twelve days is what is generated by the year. Its birth is proclaimed by blowing a conch-shell."

What is meant by the above passage is this:—The first day of the twelve days is observed as an *Atirātra* day, with the recitation of twenty-four Sāma verses, in the beginning of the year; the period of nine days is inserted in the middle of the year. the remaining two days are observed as the day of the Mahāvratā or great vow and as a final *Atirātra* day at the close of the year. This is what is meant by observance of the twelve days in their respective places. Others seem to have been observing the same period by treating two days as *gā* and *āyus*, six days as *Prishṭhya* days, and the remaining four days as the first four days of the six *Abhiplava* days. The blowing of a conch-shell seems to have been to inform the people of the arrival of the twelve days of vow, when it was obligatory for each sacrificer, and perhaps for the people also, to observe the rites of *Dikṣā* or initiation, in order to get rid of the sins of the year.

³⁰ Those who observed the twelve days in this way seem to have been adding them at the close of the year.

It is true that it is not clearly stated in the above passage that the period of nine days was inserted in the middle of the year; still, from the names given to the nine days and from the commentary of Agnisvâmin on *Lâtyâyana-Srauta-Sûtra* IV 6. 12, we can clearly understand that nine out of the twelve days were inserted at the middle of the year; the commentary says:—

अभिजित् त्रयस्वरसामानः विषुवान् आवृत्तास्त्रयस्वरसामानः विश्वजित् इत्येष नवाहः

"The day called *Abhijit*, three *Svarasâman* days, the central day, the three *Svarasâman* days again repeated in the reverse order, and a *Viśvajit* day, constitute the period of nine days."

It should be noticed here how the central day of the year is plainly stated to form part of the nine days. It follows, therefore, that the period of nine days was inserted in the middle of the year. It must also be borne in mind that whenever a day or days is or are called *Abhijit*, *Viśvajit* or *Svarasâman*, it or they must be regarded as falling in the middle of the year.

Again, the other sūtra, in the commentary on which Agnisvâmin distinctly says that the period of nine days was inserted in the middle of the year, is one which deserves our particular attention. It is also desirable that we should consider the chapter in which this sūtra occurs together with the chapter which precedes it. In these two chapters (IV, 5, 5-6) *Lâtyâyana* describes the various forms of the rites and recitations assigned to the days of *Gavām-Ayana*. While describing the form of the rites to be performed on the *Svarasâman* days which form part of the period of nine days, he refers to a school of sacrificers who are said to have been observing twenty-one days instead of nine days in the middle of the year. This sūtra IV 6. 12, with Agnisvâmin's commentary on it, runs as follows:—

एकविंशत्यहकारिण उपरिष्टाभिजित् पृष्ठमुपयन्ति प्राक्च विश्वजितः स्वरसाम्नश्चोक्त्यान्.

योऽयं संवत्सरस्य मध्ये नवाहः पठितः अभिजित् त्रयस्वरसामानो दिवाकीर्त्यमहः त्रयस्वरसामानो विश्वजितिनि एतस्य स्थाने अपरे एकविंशत्यहं कुर्वन्ति. उपरिष्टाभिजित् प्राक् स्वरसाम्नः पृष्ठमुपयन्ति. प्राक् विश्वजित् स्वरसाम्नः कृत्वा पृष्ठमुपयन्ति स्वरसाम्नश्चोक्त्यान् कुर्वन्ति. विचारितमिदं ब्राह्मणेन.—तानाहुरुक्त्या कार्याऽभिमिष्टोमा इत्येवमुक्ताह तद्वर्षावधमिव वा एतद्यमिष्टोमो विषुवान् अभिमिष्टोमौ विश्वजित् अभिमिष्टोमौ विश्वजित् अभिमिष्टोमा एव सर्वे कार्या इति. यद्यमिष्टोमं तदेव शब्देन नियमितं. एवं नियमिते सति किमुक्त्यस्त्वं स्वरसाम्नां प्रत्याम्नातमेव अथ विकल्पः इति. उच्यते न प्रत्याम्नायते न च विकल्प्यते? ये एकविंशत्यहकारिणः ते उक्त्यान् कुर्वन्ति ये नवाहकारिणः ते अभिमिष्टोमानेव, एवं च कृत्वा निदानकारोऽप्याह—अथैते स्वरसामानः तानमिष्टोमान्नवाहकारिणः कुर्युः उक्त्यानेकविंशत्यहकारिणः योऽन्यथा कुर्यादकुशलः पुरुष इति विद्यासिन्ति.

"Instead of the period of nine days, which is spoken of as a period inserted in the middle of the year and which is composed of one day called *Abhijit*, three *Svarasâman* days, one day termed *Divākīrtya* [i.e., the central day], again three *Svarasâman* days, and one *Viśvajit* day, other insert twenty-one days. after the *Abhijit* day and before the three *Svarasâman* days, they insert six days known as *Prishṭhya* days; again after having observed the three *Svarasâman* days (after the central day) they insert six *Prishṭhya* days before the *Viśvajit* day. Also they treat the *Svarasâman* days in the *Ukthya* way. This matter is found discussed in the *Bṛāhmaṇa*:—They debate as to whether the *Svarasâman* days are to be treated in the *Ukthya* way or in the *Agnishṭôma*⁸⁷ way. After saying that, the *Bṛāhmaṇa* goes on to state:—They say that the fulcrum-like support of the year is the central day which is treated in the *Agnishṭôma* way, and the two days called *Abhijit* and *Viśvajit* which are also treated in the *Agnishṭôma* way. The other days are

⁸⁷ *Agnishṭôma* and *Ukthya* are two forms of sacrifice: the former is a simple one-day sacrifice in which a he-goat, sacred to Agni, is immolated and twelve hymnal verses are chanted; the latter requires the immolation of a second victim, a he-goat to Indra and Agni, and the chanting of fifteen verses.

observed in the Ukthya way. Others say that *all* the days should be treated *only* in the Agnishtôma way.—By the word ‘only’ used in the statement, it is the Agnishtôma way that is ruled in preference to the Ukthya way. The rule being thus stated, there still arises the doubt as to whether the *Svarasâman* days are to be observed only in the Agnishtôma way or in either of the two ways, the Agnishtôma and the Ukthya ways. It is not, however, a rule that the *Svarasâman* days are to be observed only in the Agnishtôma way; nor is it an alternative that they may be observed either in the Agnishtôma way or in the Ukthya way. But it is a matter differing according to different schools: those who intercalate twenty-one days observe them in the Ukthya way, while those who insert nine days treat them only in the Agnishtôma way. The author of the Nidâna-Sûtra also says (V. 7):—“Then the *Svarasâman* days; those who insert nine days treat them in the Agnishtôma way; while those who intercalate twenty-one days observe them in the Ukthya way.”³⁸ Whoever treats them otherwise is to be regarded as a man devoid of knowledge.”

The essential points that we have to consider, setting aside the other details discussed in the above passage, are the intercalation of nine days and that of twenty-one days in the middle of the year. The period of nine days has already been shown to be a period which forms part of twelve days inserted either in the middle of the year or at its close. But we are not expressly told of the particular form of the year which with the addition of 12 or 21 days would, as stated by Dhânampâpya (see under Nidâna-Sûtra VI. 6), results in a Samvatsara or true or almost true year. Still from the consideration of the data contained in the sûtras themselves, it is easy to determine them. We know that the purpose of intercalation is to adjust any two kinds of years so that the seasonal and other characteristics are as well defined in the one as in the other. We also know that, of the various kinds of years, those which were the first to be recognised were such as consist of twelve or thirteen months, each of which is well marked by the recurrence of certain celestial phenomena. The sidereal lunar month of 27 days, for example, seems to have been adopted because it is marked (though not quite exactly) by the moon’s completion of a round through the heavens. Likewise, the synodic lunar month of $29\frac{1}{2}$ days is marked by the occurrence of full or new moon. It is the consideration of the recurrence of seasonal characteristics that led the ancients to assign to the year twelve or thirteen months, during which they expected, in virtue of long experience, a complete round of all the seasons. But it is well known that neither the sidereal lunar year of 351 days, nor the synodic lunar year of 354 days, nor even the sâvana year of 360 days, is in exact agreement with the round of the seasons. Hence it is that the ancients seem to have been led to discover the sidereal and the solar years, in the course of which the seasons fairly will complete a round, and that they began to adjust the years of their first selection with the sidereal solar year. Now, we may confine ourselves to four of the five and know that there are four kinds of years mentioned in the Nidâna-Sûtra:³⁹ the sidereal lunar year of 351 days; the synodic lunar year of 354 days; the sâvana year of 360 days; and the sidereal solar year of 366 days. Of these, it cannot be the year of 351 days to which the Vedic poets added 12 intercalary days; for, with the addition of 12 days, it amounts to only 363 days, which is less than a true year, while with the addition of 21 days it gives 372 days which is more than a true year. It is true that the so-called Gavâm-Ayana year described in all the Srauta-Sûtras consists of 360 or 361 days, in the middle of which were put nine days bearing the same names with the nine days which formed part of the Dvâdasâha or period of twelve days. Hence we might be led to think that that year in which twelve days were intercalated might be a vague year of 348 days, which, with the addition of 12 days, would make a year of 360 days termed Gavâm-Ayana. But no year of 348 days is mentioned in any of the Srauta-Sûtras. And as regards the school of Vedic poets who, according to Lâtyâyana IV, 8. 15, adopted a month of

³⁸ See Calendar Form IX., p. 71 above.

³⁹ There is also a fifth, of 324 days; see p. 50 above.—Dr. Fleet.

29 days and a year of 348 days, we are told by Lātyāyana himself that they were observing 17 *Dikṣhā*-days or days of initiation, before they commenced their sacrifice on the New Year's Day. Also, the so-called Gavām-Ayana year is not, as I have pointed out in chapter III of my *Vedic Era*, a true year, but an imaginary year, made up of all those twenty-first days in a cycle of four *sāvāna* years which had been so far counted as often as they occurred. Hence it cannot be the *sāvāna* year in the middle of which nine of twelve days were inserted. It follows, therefore, that it is the synodic lunar year of 354 days to which the addition of 12 days must have been made, in order to adjust it with the sidereal solar year of 366 days. As regards the year to which the addition of 21 days was made, it appears to be a cycle of three *sāvāna* years each of 360 days, followed by a year of $360 + 21 = 381$ days, with the result that four *sāvāna* years, each of 360 days, with the addition of 21 days, were rendered equal to four Julian solar years each of 365½ days. That the Vedic poets had been observing such a cycle of years with 21 intercalary days is almost expressly stated in the following passage of the Nidāna-Sūtra, X, 1 :—

एकविंशतिरात्रे सप्तमासते. उत्तरं त्रैते सामस्य निश्चयति. एकविंशतिरात्रं च द्वादशाहं चैते नानात्व-
कृते इति. पञ्चाहकूसमुत्तमं. प्रथमे विषमयुक्ता. पञ्चाहाः हंत पञ्चाहानेव करवाणि. एवं पञ्चवीस्समाधिरिति.

“On the day immediately before the twenty-first day, they sit at their sacrificial session. On the following day they put the last day [*i.e.*, the 21st day] in its entirety. The period of 21 days and that of 12 days are varieties (*of adjusting the years*). The last [*i.e.*, the 21st day] is based upon the period of five days; the original periods of five days are accompanied by an odd portion (*of a day*). Lo! I shall observe only five days; by my doing so the parts of the year are undisturbed.”

In another place the Nidāna-Sūtra, VIII, 11, says that the odd portion of a day accompanying the five days is neither more nor less than a quarter of a day. The passage in which this idea is implied runs as follows :—

ऋतुपडहे कथं रात्रिरिति. अकर्तव्येति शौचिवृक्षि एवमुदाजो हि भवति. अपाप्यनादिष्टा व्युहेन भवति. अथापि कथमहीनाहो रात्रेरुपायोऽभविष्यदिति अथापि कृत्स्नतायै वै नूनमिह रात्रिः क्रियेत. कृत्स्नोऽयं पडह इति. अथाप्येष चतुर्थो भागो रात्रेः प्रत्यङ्गितामयकमिष्यदिति. कर्तव्येति गौतम. आदिष्टा कल्पेन भवति. अथाप्येषा अहीनसंस्था यद्रात्रिः नामवसानभूता पञ्चमहरागच्छति.

“How is the night observed as part of the sacrifice performed during the Seasonal Six days? Sauchivṛkṣi says that it need not be observed, for the reason that its origin is such. Also, it is inferred rather than prescribed in the Kalpa texts. How then are the *Ahina* days⁴⁰ to commingle with the night? Verily it is merely on account of its completion that the night has to be observed here, for the period of six days has become complete. Also it is the one-fourth part of the night that has grown (*into a whole day*). Gautama says that it is to be observed and that it is prescribed in the Kalpa texts. The night forms part of the sacrificial days which constitute the *Ahina* period; the sixth day arrives at the close of the night.”

From these passages it is clear that the Vedic poets were quite aware the fact of a solar year being greater than the *sāvāna* year by five days and a quarter. This they seem to have found out by closely observing the fluctuations in the seasons, which they must have necessarily experienced so long as they had used a year of only 354 or 360 days. It is this inevitable change of the seasons in the lunar and the *sāvāna* years that is implied in the term *Ritu-śākhā*, meaning the six days capable of keeping the seasons in their proper places in the year. It should also be noted how the sixth day of the Seasonal Six days is termed an abnormal growth of a quarter of a day in the

⁴⁰ An *Ahina* sacrifice extends as far as 11 days, and seasonal sacrifices from the 12th day onwards: Nidāna, ix, 6, on the 11th day the night falls. Nidāna, ix, 8.

above passage. There is also a passage in the *Krishṇa-Yajurveda* in which it is clearly stated that the five days after the close of the *sāvāna* year are such as have the power of creating the seasons. The passage, VII. 1. 10, runs as follows:—

संवत्सरो वा इदमेक आसीत्. सोऽकामयत्तृन्मुञ्जेयेति. स एतं पंचरात्रमपश्यत्. तमाहरत्. तेनायजत. ततो वै स ऋतूनसृजत य एवं विद्वान्पंचरात्रेण यजते प्रैव जायते. त ऋतवस्मृष्टा न व्यावर्तत त एतं पंचरात्रमपश्यन् तमाहरन् तेनायजत ततो वै ते व्यावर्तत. य एवं विद्वान्पंचरात्रेण यजते वि पाप्मना भ्रातृभ्येनावर्तते. सार्वसेनि-
इशौचैर्वाऽकामयत पशुमान् स्यामिति. स एतं पंचरात्रमाहरत्तेनायजन. ततो वै स सहस्रं पशून्प्राप्नोत् य एवं विद्वान्पंचरात्रेण यजते प्र सहस्रं पशून्प्राप्नोति. बबरः प्रावाहणिरकामयत वाचः प्रवदित्वा स्यामिति स एतं पंचरात्रमा-
हरत्तेनायजत. ततो वै स वाचः प्रवदित्वाऽभवत् य एवं विद्वान्पंचरात्रेण यजते प्रवदितैव वाचो भवति अथो एनं वाचस्पतिरित्याहः अनामश्चतुरात्रोऽतिरिक्तषड्रात्रः अथवा एष संप्रति यज्ञो यस्पंचरात्र य एवं विद्वान्पंचरात्रेण यजते संप्रत्येव यज्ञेन यजते पंचरात्रो भवति पच वा ऋतवस्संवत्सरः ऋतुष्वेव संवत्सरे प्रतिनिष्ठति.

"The year (of 360 days) was of yore undifferentiated: it desired that it might create the seasons, it saw the five nights, caught hold of them, and sacrificed by them; then it created the seasons whoever with this knowledge sacrifices by the five nights becomes endowed with children. The seasons, once created, did not regularly return again they saw the five nights, caught hold of them, and sacrificed by them: then they regularly returned: whoever with this knowledge sacrifices by the five nights gets rid of his sin, his powerful enemy [i.e., the intercalary days burdened with sin]. Saubhaya, the son of Sarvasēna, desired that he might be possessed of cattle, he caught hold of the five nights and sacrificed by them, then he obtained a thousand head of cattle: whoever with this knowledge sacrifices by the five nights obtains a thousand head of cattle. Babara, the son of Prāyāhani, desired that he might be possessed of eloquence: he caught hold of the five nights and sacrificed by them; then he became an orator: whoever with this knowledge sacrifices by the five nights undoubtedly becomes an orator, him they call the lord of speech. Four nights are less, six nights are more: the sacrificial period of five nights is neither less nor more: whoever with this knowledge sacrifices by the five nights acquires the merits of a sacrifice performed neither in less nor in greater time. Five are the nights and five are the seasons which compose a year. (whoever observes them) gets a firm footing in the seasons of the year."

If we read the above three passages along with Agni-vāmin's commentary on Lāṭyāyana's aphorism, IV. 6. 12, and the two verses of the *Sāmaveda*, II. 1. 17. 3. and VI. 2. 2. 7, together with the verses of the *Atharvaveda*, IV. 15. 13, and IV. 16. 6, all of which are quoted above, we can clearly understand that, when the Vedic poets recognised the failure of the synodic lunar and the *sāvāna* years to keep pace with the course of the seasons, some of them seem to have discovered the sidereal solar year of 366 days, and regarded it as capable of agreeing with a round of the seasons. Others, with more accurate observation, seem to have been divided in their opinion, and to have taken a vague solar year of 365 days according to some, and a more true solar year of 365½ days according to others, as the one fairly agreeing with the course of the seasons. Those who observed the synodic lunar year of 354 days seem to have been passing 12 days in *Dikṣā* or vow of initiation after its close and before the commencement of the sidereal solar year. Of those who followed the *sāvāna* year of 360 days, some seem to have been adjusting it with a solar year of 365 days by adding five days to it, as exclaimed by the speaker in the *Nidāna-Sūtra*—
"Lo! I observe only five days, thereby making the two wings of the year undisturbed." But those who were still more accurate in their observation appear to have framed a cycle of four *sāvāna*-and-solar years, and to have adjusted the *sāvāna* year with a solar year of 365½ days by adding $5\frac{1}{2} \times 4 = 21$ days to every fourth *sāvāna* year. As we have already seen, this period of 21 days has been called by various names: some called these days the thrice seven milch-kine pouring their genuine milky draught for the nourishment of Sōma, the moon; others seem to have regarded them as the 21 fetters of Varuna, to be got rid of by the observance of the rites of

Dikshā and *Upasā*. There is no reason to doubt that it is these twenty-one days which, as stated by Agnisvāmin, were inserted in the middle of the year as an alternative for the twelve days inserted by others. We may therefore take it for granted that the statement of the *Tāndyamahābhāṣya*, xxv. 18. 1, that "five times fifty periods of 21 days make one thousand years of the Viśvasṛiks," is one which was based upon an actual practice, and was not a mere theoretical problem as has been held by one critic of my views.⁴¹

Besides the period of 1000 years, the *Tāndyamahābhāṣya* mentions three minor periods, naming the priestly astronomers who observed them. Prajāpati seems to have been the first to observe for verification three cyclic years with twenty-one intercalary days in the course of twelve solar years. The passage in which this is mentioned, xxv. 6. 1. 2, runs as follows :—

त्रयस्त्रिवृत्स्ववत्सरास्त्रयः पञ्चदशः त्रयस्सप्तदशस्त्रय एकविंशतिः प्रजापतिर्द्वादशसंवत्सरम् । एतेन वै प्रजापति-
स्सर्वस्य प्रसवमगच्छस्सर्वस्य प्रसवं गच्छति य एतदुपयति ।

"Three sets of nine, three sets of fifteen, three sets of seventeen, three sets of twenty-one made up the period of twelve years for Prajāpati. With this (*observation*), Prajāpati attained the means of producing all (*the years*). Those who follow this procedure will have the means of producing all (*the years*)."

Likewise, the period of 36 years which the school of the Sāktyas are stated to have observed is thus described in the same work, xxv. 7. 1.

नव त्रिवृत्स्ववत्सरा नव पञ्चदश नव सप्तदश नवैकविंशतिश्चान्यानां षट्त्रिंशत्संवत्सरम् ।

"Nine sets of nine, nine sets of fifteen, nine sets of seventeen, nine sets of twenty-one, made up thirty-six years for the Sāktyas :—

Likewise, a third minor period of a hundred years of the Sādhya is thus described in the same work, xxv. 8. 1. 2 :—

पञ्चविंशतिस्त्रिवृत्स्ववत्सराः पञ्चविंशतिः पञ्चदशः पञ्चविंशतिस्सप्तदशः पञ्चविंशतिरेकविंशत्संवत्सरानां शतसं-
वत्सरम् । साध्या वै नाम देवेभ्यो देवाः पूव आसन् । त एतस्त्रयायणमुपायन् तेनार्धुवन् । ते सगवस्सपुरुषास्सर्व एव
सह स्वर्गं लोकमायन् । एवं वाव ते सह स्वर्गलोकं गति य एतदुपयति ।

"Twenty-five sets of nine, twenty-five sets of fifteen, twenty-five sets of seventeen, twenty-five sets of twenty-one, made up the one hundred years of the Sādhya. The Sādhya were gods earlier than other gods; they observed this session of one hundred years; they prospered thereby; and they all attained the heavenly world with their cows and men. Verily do those who observe likewise reach the heavenly world.

So far as numerical riddles are concerned, there is no difference between the above three passages and the one in which the period of a thousand years of the Viśvasṛiks has been described in the *Tāndyamahābhāṣya*. Hence the above three passages may be interpreted in the same way as I have explained the last passage in my *Velic Era*. Three, nine, or twenty-five sets of nine periods of five days each or of forty-five days, which form the difference between four lunar and solar years, are equivalent to 12, 36, or 100 solar years respectively. Similarly, three, nine, or twenty-five sets of such 15 days as remain after we deduct a month from 45 days in every cycle of four lun-solar years, are equivalent to 12, 36, or 100 years respectively. Likewise, three, nine, or twenty-five sets of 17 days which form the difference between four of Jupiter's years and four solar years, are equivalent to 12, 36, or 100 years respectively.⁴² Since twenty-one days form the difference between four Sāvana years and four solar years, three, nine, or twenty-five times twenty-one days are equivalent to 12, 36, or 100 solar years respectively.⁴³

⁴¹ J. R. A. S., 1909, p. 478.

⁴² It is practically impossible that there can have been any Jupiter's years in Vedic times. Much better omit this, which seems quite superfluous. If there were any Jupiter's years then, they would be the beholder-rising years, each of 399 days.—Dr. Fleet

⁴³ These cyclic periods are also mentioned in almost all the Śrauta-Sūtras, see, *Sanhāyana*, xiii. 28. 5-8.

It should be noted how the periods of 12, 36, 100, and 1000 years are connected with Prajāpati, the Śaktyas, the Sādhyas, and the Viśvānaks, respectively. If the above four passages had been meant to be mere formulæ rather than traditional statements of the actual practice of Prajāpati and the three priestly schools, then there would have been no necessity to mention them. There is no reason why the author of the *Tāndyamahābrāhmaṇa* should go so far as to connect a formula, if it was a mere formula at all, with the Sādhyas, whom he has clearly described as a school of ancient priests. It follows therefore, that the periods of 12, 36, 100, and 1000 years are years of the Vedic era, actually counted by Prajāpati and the three successive priestly schools in terms of the number of times they intercalated twenty one days or cows.⁴⁴ It is thus clear that the Vedic poets were quite familiar with the true solar year of 365½ days and were adjusting the sāvana year to it by adding 21 days once in every four years, and that they kept an account of the number of intercalations, calling it the Gavām-Ayana or "Cows' Walk." If there is still any doubt as to the precise significance of the term Gavām-Ayana, it will be removed by the evidence which I may perhaps set forth in a subsequent article on the Vedic era and chronology.

III—The Ayanas or Sattras.

The word *ayana* literally means 'going, movement'; and when combined with such words as *gavām*, 'of cows', and *jyōtiṣhām*, 'of lights', it means 'the movement of cows' and 'the movement of (the heavenly) lights'. We have already seen how the Vedic poets used to call the first day of their *Shodaha* or six-days' period by the name *jyōtiṣ*, 'light', and the second day by the name *gā*, 'cow'. It follows, therefore, that the terms *Gavām-Ayana* and *Jyōtiṣhām-Ayana* mean 'the march of days'. The question is: what days? ordinary days or special days? Almost all oriental scholars seem to regard the days as ordinary ones. And the sacrificial year of 360 or 361 days described in all the Śrauta-Sūtras under the name of Gavām-Ayana, with special chants, recitations, and rites for each day, has been accordingly taken by them to mean an ordinary year.

But there is evidence to indicate that this is not the sense in which the Vedic poets used the term. We have already seen how, in describing the four forms of Gavām-Ayana, the author of the *Nidāna-Sūtra* has specified the suppression and intercalation of days as the chief feature of the *Ayanas*. We are told to suppress or omit nine days from the sāvana year of 360 days in order to form a sidereal lunar year of 351 days, which is a year of 13 months each of 27 days. We are also told of the synodic lunar year of 354 days with an implanse of 12 intercalated days, and of the cycle of 37 or 38 months with 18 intercalated days, towards their adjustment with the sidereal solar year of 366 days. We are not told, however, the precise meaning of the term Gavām-Ayana. From the way in which the author of the *sūtra* has explained the four forms of Gavām-Ayana, we may interpret it in three different ways: we may take it to mean the four ordinary years, the sidereal lunar year of 351 days, the synodic lunar year of 354 days, the sāvana year of 360 days, and the sidereal solar year of 366 days; or we may take it to mean the suppressed period of nine days, and the intercalary periods of 12, 18, and 21 days, of which the intercalary period of 21 days is, as we have already seen, mentioned in a later chapter of the same *sūtra*.⁴⁵ But *Liṭyayana* seems to take the term in the sense of an intercalary period: in chapters 5 to 7 of the fourth book of his *Śrauta Sūtra*, he proposes to discuss the varieties of Gavām-Ayana, and describes the rites and recitations pertaining to the periods of 12 and 21 days; while in the 8th chapter of the same book, he proceeds to discuss the varieties of *Jyōtiṣhām-Ayana*, and enumerates the various kinds of years and the intercalary days necessary to adjust them. From this it is clear that of the three terms, *Samvatsara*, *Jyōtiṣhām-Ayana*, and *Gavām-Ayana*, the first means an ordinary year of 354,

⁴⁴ It is probable that though based upon different units of intercalary days, these three cycles are here expressed in terms of the unit of twenty one intercalary days, as though these cycles were consecutive years.

⁴⁵ See Chapter II, above.

354, or 360 days, the second the year with an intercalary period, and the third an intercalary period made up of any number of intercalary days. That the terms Samvatsara and Gavām-Ayana are by no means synonymous, is also clear from what Sāṅkhāyana says about the repetition of Gavām-Ayana. He says (xii. 27. 5)—अभ्यासो बहुसंवत्सरं गवामयनस्य “when the number of years is great, repetition of Gavām-Ayana is to be observed.” It is clear that, if the terms Samvatsara and Gavām-Ayana had been synonymous, there would have been no necessity for such a remark. I need not point out how the sūtra would be meaningless if the two terms Samvatsara and Gavām-Ayana were taken synonymously. Nor can we take the term Gavām-Ayana in the sense of a year with an intercalary period: for in that case the sūtra would mean that, when the number of years is great, all those years with their intercalary periods should be repeated,—a statement which is unpractical. It follows, therefore, that the term Gavām-Ayana means an intercalary period and an intercalary period alone, no matter what may be the number of days constituting that period. For the formation of Gavām-Ayana, two units of intercalary periods seem to have been selected: they are (1) a period of 11 or 12 days inserted at the close of every year, and (2) a period of 21 days inserted in the middle of every fourth year.⁴⁶ The sacrifices that were performed during either of the two intercalary periods are called *Satras* or sessional sacrifices. It appears that when such sessional sacrifices were not performed,—say, for about a hundred years—a sacrificial session extending for 100×11 or 100×12 days, or 25×21 days, was held once for all. We shall see presently that, instead of holding the session during as many days as constituted the intercalary periods left in abeyance, they seem to have limited the number of days by substituting one day for each intercalary period. Thus a session of 100 days or of 25 days seems to have answered the purpose of 100×12 days or of 25×21 days in a hundred years. Also it appears that when one or more such single intercalary days were being celebrated, all the past intercalary days were recalled and celebrated along with the new ones, and that the whole session was termed Gavām-Ayana. Those who had different units of intercalary days seem to have followed the same procedure, with the difference that, instead of substituting single days for their units of intercalation, they used to hold their sacrificial session for as many days as there were in all their units of intercalation. The three sacrificial sessions of the Tapaśchits, for example, consist of four, twelve, or thirty-six years corresponding to the 360 days composing a Gavām-Ayana year. These three sessions are so arranged that twenty-four, seventy-two, or two-hundred and sixteen months form the first half of the session, and the same number of months form the second half. This is what the Nidāna-Sūtra, X. 9, says about them:—

अथैतन्महातापाश्रितमित्याचक्षते चत्वारो वैश्वसंवत्सराः चत्वार ओपसदाः चत्वारस्तोत्याः तस्य कल्पो गवा-
मेवायनं चतुर्ष्वपि अपि वा एतस्यैव पक्षसी अनिवृद्धे स्याताम त्रयोविंशतिरयनमासा पूर्व पक्षसि स्थोविंशतिरुत्तरं
अपि वैतास्यैव प्रथमानि चत्वारि तमस्यैव यथा त्राणि संवत्सरे इति. अपि वा ज्योतिष्टोमायनमेव कुर्वीरन् एतेषां
यन्मस्यैरन् तदपि वा यथा गणसंवत्सराणां तथा कल्पं कुर्वीत. अथैतच्छाक्त्यानां षट्त्रिंशत्संवत्सरम्. नरसपुरोडाश-
मन्त्रसंरोभात् यदत पुरुष तदन्नदास्य देवतेति. ते यन्मांसमया वा इयमाकमयावांने भवन्ने हविद्वमिति अथैतानि
महासत्राणि देवानामेव दीर्घायुषो देवा इति मनुष्याणामपि सिद्धानि स्थिरित्यपरम्. बहवस्सन्निविश्य मुनयु एवाः पौत्राः
प्रपौत्रा इति. तानि खल्वतिरात्राणि विष्णुवत्कानि ऊर्ध्वयनात्मीमानि भवन्ति. तत्र यदतिरात्रं वा विष्णुवं वाऽकुरिष्यत्
तुल्यो रोहोऽभविष्यत्. अथापि न कपेनादौशो विज्ञायते नु ब्राह्मणेन, अथाप्येव पुराणं वेदयते अथाप्येकविंशत-
स्तोमानां भवतीति.

“This is what they call the major session of the Tapaśchits. Four years are spent in performing the initiatory rites; four years in Upasads; and four in pressing the Sōma plant. Its arrangement is thus:—They may repeat the Gavām-Ayana four times (for each of the three sets of four years making twelve years); or else the two wings or parts of the original Gavām-Ayana may be so lengthened that twenty-three Ayana months fall in the first wing or part of the session and twenty-two months in the second part.”⁴⁷

⁴⁶ See Nidāna-Sūtra, x. 1, quoted above.

⁴⁷ These forty-five months, together with the sixth, the seventh, and the last (i. e., twelfth) month of the original Gavām-Ayana year inserted in all such cases, amount to forty-eight months or four Gavām-Ayana years.—Gargyaśāraṅgī's Commentary on *Āśvalāyana*, xii. 5, 14.

"Or else the minor session of a year of the Tapaśchits may be repeated four times, so that with three such sessions the major session of twelve years is completed or else they may observe the session in the Jyōtishṭōma way (*i. e.*, the Gavām-Ayana); or else they may hold their session in each year seriatim (*gaṇasamvatsarārdhāṇ kalpa*).⁴³

"Then the sacrificial session of thirty-six years of the Śāktyas. The foodstuff used in this sacrifice is flesh instead of cooked rice; for the Inner Man is the food-giving deity of this sacrifice. Usually these two food-stuffs, flesh and rice, are the sacrificial offerings.

"These long sessions are meant only for gods, for the gods (*alone*) are long-lived. Others think that they are possible also for men; according to them, many persons, such as sons, grandsons, and sons of grandsons undergo initiation successively and press the Sōma-plant. These Atirātra days are not accompanied by the central day of the year and constitute what is called *Urdhrāyana* or 'lengthened year.' If the Atirātra day or the central day is celebrated (*one after another*) then the desired ascending order (*in the era or years*) is secured. No rule about these sessions is laid down in the Kalpas or in the Brāhmanas. Still they teach us this ancient doctrine (namely the Gavām-Ayana and other varieties). Of all the units of intercalary days celebrated by chanting as many Sama-verses as the number of days in each unit, the unit of twenty-one intercalary days is the last."

The most important points that are to be particularly noticed in the above passage are: (1) the duration of the session of the Tapaśchits as compared with that of the Gavām-Ayana, (2) the spreading out of the session; (3) the question raised by the author of the Nidāna-Sūtra as to the possibility or impossibility of all the sessional sacrifices being observed by a single man, however long-lived he might be, and (4) the absence of the central day of the year in these sessions. We shall presently see how in the place of twelve days celebrated by others, probably at the close of every fourth year, some celebrated only a single day. It follows, therefore, that if the latter counted 360 such single days, the former would count twelve times as many days. This is what appears to have been meant by the statement that the twelve-years' session of the Tapaśchits is equal to twelve times the duration of the Gavām-Ayana. In his commentary on the Śrauta-Sūtra of Āśvalāyana, Gārgya-nārāyaṇa has clearly stated that the twelve-years' session of the Tapaśchits may be so spread out that seventy-two months shall fall in the first half of the session and the same number of months in the second half.⁴⁴ Likewise, the session of thirty-six years of the Tapaśchits or of the Śāktyas. This amounts to saying that, just as twelve or twenty-one days are inserted in the middle of an ordinary year, these sessions of four, twelve, or thirty-six years are also inserted in the middle of an ordinary year. It is clear, therefore, that all these sessions are intercalary periods, not ordinary years. Had these and other sessions been ordinary years, the question raised by the author of the Nidāna-Sūtra about the possibility of all the sessional sacrifices being performed by a single man would not have cropped up at all; for it is quite possible for a man to live for 56 or 60 years, so that he may commence a sacrifice in his 20th or 24th year and bring it to a close after 36 years. It follows, therefore, that these sessional days are not ordinary consecutive days, but periodical intercalary days. We shall see that the Vedic poets knew that the solar year differed from the synodic lunar year by $11\frac{1}{4}$ days

⁴³ This seems to refer to the intercalation of five days to each year see Nidāna-Sūtra, x, 1. For other varieties of the session of the Tapaśchits, see Gārgyanārāyaṇa's Commentary on Āśvalāyana-Śrauta-Sūtra xii, 5, 14.

⁴⁴ Āśvalāyana, xii, 5, 14

and that the Sāvana year was less than the solar year by $5\frac{1}{4}$ days. When these $11\frac{1}{4}$ days made a twelfth day, as they would in every fourth year and when the $5\frac{1}{4}$ days amounted to 21 days in the course of every four years, the Vedic poets performed their sessional sacrifice on the 12th or the 21st day and counted these days apart under the name of Gavām-Ayana. Accordingly a Gavām-Ayana of 360 days is equal to $360 \times 4 = 1440$ years. If, instead of counting the 12th day apart, all the 12 days were counted apart, as the Tapaśchits seem to have done, even then the session of 12 years would still be equal to $12 \times 360 \times 4 \div 12 = 1440$ years. It is clear that no man can possibly live for 1440 years and perform the sacrifice of so long a session. Similarly, for each day counted by the followers of the Gavām-Ayana, the Sāktayas seem to have counted 36 days in every cycle of four years, and to have thereby counted 36 years in the course of 1440 years. Clearly, then, the performance of all these sessional sacrifices, and the counting of such great periods of years, was the work, not of one man, but of generations consisting of sons, grandsons, and sons of grandsons and others, as stated by the author of the Nidāna-Sūtra. It follows, therefore, that Jaimini's interpretation of the 250 twenty-one days' session, or of the one thousand years' session of the Viśvasṛiks, in the sense of a session of 1,000 days, in order to make the performance of all the sessional sacrifices possible for a single man, is entirely wrong, and quite against ancient tradition as set forth in the Nidāna-Sūtra. Scholars who have been entertaining doubts about the Vedic chronology should pay particular attention to the statement of the author of the Nidāna-Sūtra, that these sessional days are all Atrātra days with no central day, and that, if the Atrātra day or the central day is counted apart *seriatim*, the desired ascent (*bṛthō rōhah*) in time is secured. This is clear proof that the Vedic poets kept an era of their own in terms of Atrātra days or of central days.

In explaining the above passage, I stated that, corresponding to the celebration of a single day by the followers of the Gavām-Ayana, others, like the Tapaśchits, celebrated twelve intercalary days at the close of every fourth year. This statement requires proof, and that proof is contained in the following passage of the Nidāna-Sūtra, IV, 12 :—

अथातो गवामयनम् तदेक एकादशमिविधप्रये ज्योतिष्टोत्रेण. अथैके अतिरात्रचतुर्विंशन्वाह्नतानिरात्र इति कृत्वा ज्योतिष्टोत्रेनैव संस्तृणति. अथैके गोआयुषी दशरात्रमिष्टुपाहरति. एतं संवत्सरप्रबर्ह इत्याचक्षते संखाहृतमिति च.

“Then as regards the Gavām-Ayana :—

Some celebrate it in one day in the Jyōtiṣṭōma way; others spread it also in the Jyōtiṣṭōma way over twelve days, of which the first day is an Atrātra day with the recitation of 24 verses, followed by nine days, the day of Mahā-Vra^ह a final Atrātra day; some others hold it for twelve days made up of a period of two days termed *gā* and *dyus*, and another period of ten days. This period of twelve days they call ‘the growth of the year,’ and celebrate it by blowing a conchshell.”

From the Nidāna-Sūtra, X, 1, we have learnt that the periods of 12 and 21 days are two intercalary units. From the above passage we have learnt that the session of the Gavām-Ayana may be celebrated in one day, *viz.*, the 12th day or the 21st day, or during all the twelve days. It appears that like the twenty-first day, which is, as we have already seen, the product of four quarter-days at the end of four solar years, the twelfth day is also the product of the same four quarter-days. That it is the product of four quarter-days, seems to be implied in the following passage of the Nidāna-Sūtra, IX, 6 :—

अथात एकादशरात्रः एकादशरात्रांता भरीना द्वादशहमभूनीनि सत्राणि. क्रियेकं स्थानमंतरीयमिति त्रैकादशरात्रं करोति.

"Then as regards the eleven nights :—

The *Ahina* period does not extend beyond eleven nights. Sessional sacrifice is continued from the twelfth day and onwards. He observes the *Ahina* period only for eleven days, lest he might encroach upon one place (*one day*) more."

The above passage clearly shows that the difference of eleven full days between the lunar and the solar years constitutes the period of *Ahina* sacrifices, and that the twelfth day is an extra day, scrupulously excluded by the sacrificer from the *Ahina* period. By way of distinguishing between the two kinds of sacrifices, the *Ahina* sacrifices and the *Sattra* sacrifices, the author of the Nidāna-Sūtra says in IX., 9 :—

अथायं द्वादशाहोऽहीनो भवती ३ सत्रमिति. अहीनो भवतीत्याहुः एकां रीक्षन्तेति. अथाप्याहीनिकान्व-

हानीत्याचक्षते दशरात्रिकान्यहानि

यस्योऽहीना इति धानंजप्य एकाहाहीनः अहीनाहीनः सत्राहीन इति. अयं ज्योतिष्टोमोऽतिरात्र. षोडशिमा-
नेकाहाहीन. अत्र हि न किञ्चनैकाहिकं कर्म हीयत इति द्वादशाहोऽहीनाहीनः अत्र हि न किञ्चनाहीनिकमहर्ही-
यत इति. गवामयनं सत्राहीनः अत्र हि न किञ्चन सात्रिकमहर्हीयत इति.

"Well then ' does the period of twelve days constitute the *Ahina* form of sacrifices, or the sessional form? They say that it constitutes an *Ahina* period; and they declare that one person only should undergo the rite of initiation into it. But others say that the period of ten days constitutes an *Ahina* period. Dhānamjaya says that there are three forms of *Ahina* sacrifices : (1) an *Ahina* sacrifice of one day, (2) an *Ahina* sacrifice continued for several *Ahina* days; (3) *Ahina* sacrifices taking the form of sessional sacrifices. An *Atirātra* sacrifice with the recitation of sixteen verses, performed in the Jyōtiṣhtōma way, is an *Ahina* sacrifice of one day. it is so called because none of the rites usually performed in a single day are neglected here. The twelve-days' sacrifice constitutes the *Ahina* sacrifice of several days, it is so called because none of the days constituting the *Ahina* period is here lost. Gavām-Ayana forms the *Ahina* form of the sessional sacrifices; it is so called because none of the sessional days is here lost (*hina*)."⁵⁰

This apparently meaningless discussion about the distinction between the *Ahina* and *Sattra* sacrifices ends in the lame conclusion that the word *Ahina* means the absence of the loss of a day or part of a day, and that it is applicable to all kinds of sessional sacrifices in which neither a day nor part of a day is omitted. It seems probable that the eleven full days, which form the difference between the lunar and the solar years, were originally called *Ahinas* or 'not-incomplete' ones, for the reason that those eleven days are not as incomplete as the one-fourth part of a day at the end of every solar year. It is clear, therefore, that a series of the intercalary periods of twelve days, or a series of the twelfth *Atirātra* days, is taken to constitute a *Sattra* called Gavām-Ayana. Similarly, a series of the intercalary periods of twenty-one days, or a series of successive twenty-first days, is taken to constitute another form of the Gavām-Ayana. As the 12th and 21st days are the product of the four quarter-days at the close of any four consecutive solar years, the interval between any two successive twelfth days or twenty-first days must necessarily be four solar years. That a sacrificial session is made up of a series of such 12th or 21st days, is clearly stated in the Nidāna-Sūtra, III., 7 :—

अह्नैकाहसमासा ह्येव सत्राणि भवन्ति

"The assemblage of the single days closing the *Ahina* period constitutes sacrificial sessions."

That a series of successive twelfth days are termed *Atirātras*, is implied in the following passage of the Nidāna-Sūtra, ix., 10 :—

अथातस्सत्राणि. तेषां द्वादशाहः प्रथमः तस्मिन्नुपकृताति. तत्र द्वे उपधिस्थाने अंतरेणातिरात्रौ च दशरात्रं च
यत्रैकेनाह्वार्यो भवति त्रसमाहरेदेतदेकार्यं वृद्धमिति. तस्य तदेव स्थानं यस्त्वसंस्वरे. द्व्यहर्षे गो आयुषीतयो-

स्तदेव स्थानं यस्संवत्सरे. अथार्यं चिकहुकान्. चतुरार्यं व्रतचतुर्थान्. पंचार्यं अभिष्वपंचार्यं. षड-
 हार्यं अभिष्वस्संघवते. एतेन न्यायेन एष एकोत्तरकल्पः क्रमते, आ चत्वारिंशद्वात्रात्. उपनीयमानेऽव-
 हन्तु, रोहेणोपचयः प्रवर्तते. एतं रात्रिसत्रन्याय इत्याचक्षते.

“Then the *Sattras* :—Among them the period of 12 days is the first (*unit of a session*). In that period are observed all the functions of sessional sacrifices. There are two distinguishing features of it : between the two *Atirātra* days, one at the commencement and the other at the close, comes the period of ten days. When the purpose of the sessional sacrifice is served only by a one day's rite, the sacrificer should perform it in the form of the *Mahāvratā* day, for it is seen to serve the purpose of a single day : that place which such a single day has in the body of the year is its true place. When he has to observe two days, he should celebrate such days as are known by the names *gā* and *dyus* ; the very place which the two days have in the body of the year is their true place. When he has to observe three days, he should celebrate the three days known as *Trikadibukas* (1 *gyāti*, 2 *gā*, 3 *dyus*). For four days, he has to observe four *Mahāvratā* days. For five days, he should observe the first five days of the six *Abhiplava* days. For six days, there come the six *Abhiplava* days. In accordance with this principle, the period of sacrificial session progresses by the addition of single days up to forty nights. When the number of days is on the increase, the increased number of days is observed in the same ascending order. This they call the principle of sessional nights (*rātri-sattra-nyāya*).”

It is highly necessary that we should take into full consideration all that has been stated in the above passage. We know that a sacrificer proceeding to perform a sessional sacrifice may hold it either for twelve days or on a single day. Now we are told that, when he wants to finish it in one day, he should treat the day as the *Mahāvratā* day, which is the eleventh among the twelve days. By saying that the very place which it has in the body of the year is its true place, the author of the *sūtra* seems to imply that, when a single day is celebrated, it should be counted as the last but one day of the year. Since this day is also one of the days which constitute *Rātrisattra* or an *Atirātrasattra*, ‘a session of excessive nights,’ it is also called *Atirātra* like the twelfth day. For purposes of ritual convenience, the eleventh day seems to have been selected and termed the twelfth day. Next we are told of the ceremonial forms in which two days, three days, and so on, are to be celebrated. That these days, from two to forty and from forty and upwards, are not the days of the ordinary year, but are successive twelfth days treated as the eleventh or the last but one day of the cyclic year, is clear from the sessional name of *Rātrisattra* or *Atirātrasattra*, ‘session of excessive nights,’ which those days go to form. Also from what the author of the *Nidāna-Sūtra* says in another place, we can clearly understand that the days constituting the *Rātrisattra* are not the consecutive days of an ordinary year, but are such eleventh or twelfth days of the cyclic year as were once identical with new or full-moon days. In discussing the various forms of sacrifices and recitations to be performed in the sacrificial session of 33 days, the author of the *Nidāna-Sūtra* distinctly says that the days constituting a sacrificial session represent several full or new-moons, and indicate the lapse of several years. In order to understand the meaning of the passage, it is necessary that we should know the different plans of arranging the 33 days with their technical names for sacrificial purposes. According to the *Krishna-Yajurveda*, the period of 33 days is split up into an *Atirātra* day, followed by three groups of five days each and the central day followed by fifteen days. But the author of the *Nidāna-Sūtra* makes the *Viśvajit* day or the central day to occupy the 26th place in the series as shown in the adjoining table. On this central day, the priests have to recite all the six *prishtha-sūktas* and

all the ten *stômas* or collection of verses, such as nine verses, fifteen verses, seventeen verses, twenty-one verses, twenty-seven verses, thirty-three verses, twenty-four verses, thirty-six verses, forty-four verses, and forty-eight verses. We can now proceed to interpret the passage, which runs as follows:—

According to the Kṛishṇa-Yajurvêda

[J = *gyâtiś* ; G = *gô* ; Â = *âyus*.]

1, <i>Atirâtra</i> day.					
J	G	Â	G.	A.	
2	3	4	5	6	
7	8	9	10	11	
12	13	14	15	16	
17, <i>Vîśvajit</i> day.					
J	G	A	G.	A	C.
18	19	20	21	22	.....
23	24	25	26	27	28
29-32, <i>Chhandôma</i> days.					
33, <i>Atirâtra</i> day.					

According to the Nidâna-Sâtra.

1, <i>Atirâtra</i> day.				
J	G	Â.	G.	Â.
2	3	4	5	6
7	8	9	10	11
12	13	14	15	16
17	18	19	20	21
22	23	24	25	26
27, <i>Vîśvajit</i> day.				
28	29	30	31	32
33, <i>Atirâtra</i> day.				

means a total sum of days) or of a one single day and is intended to signify various *Parva*-days (that had already passed). Thus it is that the manifold functions of several years are inseparably brought into a connected whole."

Again, after discussing the necessity of reciting or not reciting the *Sâma*-Verses known as *Yajña*, *Apatya*, and *Sikvaravarṇa*, on the *Abhiplava* days forming part of the session of thirty-three days; the author of the *Nidāna-Sûtra* says :—

अथाप्येवं संप्राप्योऽयं भूयस्सांवत्सरिकं द्रव्यमनुगृह्यत इति.

X, 3.

"Thus it (*the year or era*) is to be attained. The manifold functions of several years are thus brought into favourable consideration."

Again, in connection with the session of sixty-one days, the *Nidāna-Sûtra* says :—

अथैतदेकषष्टिरात्रं संवत्सरसम्मितास्थानमेव. तत्र नवाहमभित. पृथ्वी करोति. एवं सर्वे सांवत्सरिक द्रव्यमनुगृह्यत इति.

X, 4.

"Then the session of sixty-one nights symmetrically corresponds to or implies a series of years. In the arrangement of the days of this session, the period of nine days is followed and preceded by six *Prishthya* days. Thus all the functions of the years (*era*) are brought into consideration."

From the statement that the 12 or 36 years of the *Tapaschits* cover so great a period of time that no man in his life-time can hold a sessional sacrifice during it, and from the statement that the sessional days represent various full or new-moon days and thereby imply a series of years, we can clearly understand that the *Gavām-Ayana* and other sacrificial sessions are all based upon different systems of intercalary days. We have already seen that the two important units of intercalary days are the periods of 11 days and of 21 days. Accordingly the *Nidāna-Sûtra* says that at the end of each year the sacrificer should celebrate eleven days so that all the days of the year are thereby represented, and that this process should be repeated again and again. The passage in which this idea is conveyed runs as follows :—

अथ केनासंस्तीर्णान्यभिविधीते. अतिरात्रसत्रन्यायेनेत्याह यथा शतरात्रम्. अपि वा दशरात्रं व्रतं चांतिं निधाय यथा सांवत्सरिकाणामङ्गां समवहारः सिध्येत् तथा कल्पं कल्पं कुर्वीत.

X, 5

"Then how are the sessional days treated whose ritualistic arrangement is not known. They say that they are to be arranged following the principle of excessive nights constituting a session. Or else by celebrating at the close of the year ten days together with a *Mahāvrat* day, he should perform the sacrifice, so that all the days of the year are thereby recalled. This process he should repeat again and again."

From this it is clear that the Vedic poets were celebrating 11 days at the end of each synodic lunar year of 354 days. From the *Nidāna-Sûtra*, X, 5, quoted above, we have learned that there were others who were celebrating 5 days at the close of each *Sāvāna* year of 36 days. Again, from the same passage we can understand that the periods of 12 and 21 days were taken as different units of intercalary periods. It follows, therefore, that there were four schools of astronomers during the Vedic times; a school who observed 11 days at the end of each synodic lunar year; a second school who celebrated 5 days at the end of each *Sāvāna* year; a third school who observed 21 days, of course at the end of four consecutive *Sāvāna* years; and a fourth school who celebrated 12 days at the end of every fourth synod

lunar year.⁵² It is clear, therefore, that the statement made at the close of the Taittiriya-Brâhmana, that 250 times 21 days denoted 1000 years for the Viśvasṛiks, is not a theoretical formula, but a result arrived at by regular counting made by successive generations of priests. Scholars may doubt the conclusion at which I have arrived in my *Vedic Era*, that the Vedic poets kept an era and counted 1840 years in it. But there is, at any rate, no reason to doubt that the Vedic poets had their own era and counted 1000 years in terms of 250 intercalary units of 21 days each. It remains to find out the *terminus a quo* of these 1,000 years and settle the chronology of the Vedic period.

⁵² The Maṭṭrāyaṇīya-Samhitā, however, refers to the existence of two more astronomical schools of a different kind. The Samhitā calls them Rituṃyāyus and Chāturmāsyaṃyāyus. The passage in which they are referred to runs as follows —

एकैकया वा आहृत्या द्वादश द्वादश रात्रीरयुवतः ता यावतीस्संख्यानं तावतीस्संवत्सरस्य रात्रयः . संवत्सर-
मेव भ्रातृव्याद्युवते . वैश्वदेवेन चतुरो मासानयुवतः . वरुणप्रघासैः परांश्चतुरः साकमेधैः परांश्चतुरस्तानेव भ्रातृ-
व्याद्युवतः . ऋतुयाजी वा अन्यश्चातुर्मास्ययाज्यन्यो यो वसंतोऽभूत्प्राषडभूजशरद्भूदिति यजते स ऋतुयाजी
अथ यस्त्रयोदशमासं संपादयति दशमस्य चातुर्मास्ययाजी . ऋजू चानिष्ट्वा चतुर्थमुत्सृजेत्
ऋजू द्वौ परा इष्ट्वा तृतीयमुत्सृजेत् . ये वै त्रयसः , तस्तेषां षट्त्रिंशत्पूर्णमासा यो द्वौ तयोश्चतुर्विंशतिस्तद्येऽम-
षट्त्रिंशत्याधि तानस्यां चतुर्विंशत्यामुपसंपादयति . एष वाव स त्रयोदशो मासस्तमे वैतस्संपादयति तमभियजते

Maṭṭrāyaṇīya-Samhitā I, 10, 8

With each oblation, he suppresses twelve and twelve nights. They (the oblation-) are as many, when counted, as there are nights in the year. He suppresses the year from the enemy. With Vaisvadeva sacrifice he suppresses four (intercalary months), with Varunapraghāsa the next four, and with Sākamedha the next four. These are what he suppresses from the enemy. He who sacrifices for the seasons is a sacrificer of one kind, while he who sacrifices for a set of four months is a sacrificer of another kind. He who knows that what was the spring became the rains (which in turn became) the autumn (and so on), and who accordingly sacrificed for them,—this sacrificer is one who is called to be a sacrificer for the seasons. He who gains the thirteenth month and sacrificer for the thirteenth month is one who is said to be sacrificer for the four months. Having Sacrificed during three ordinary (Ritū) [months], he should omit the fourth. Then having sacrificed during (the next) two ordinary (months), he should omit the third. As to the three years there are, in them there are thirty-six full moons, as to the two, in them there are twenty-four. As to those (days) which except (an intercalary month) in the thirty-six full-moons, he takes them to these latter twenty-four months. This is really the thirteenth month, He gains it and sacrifices for it

